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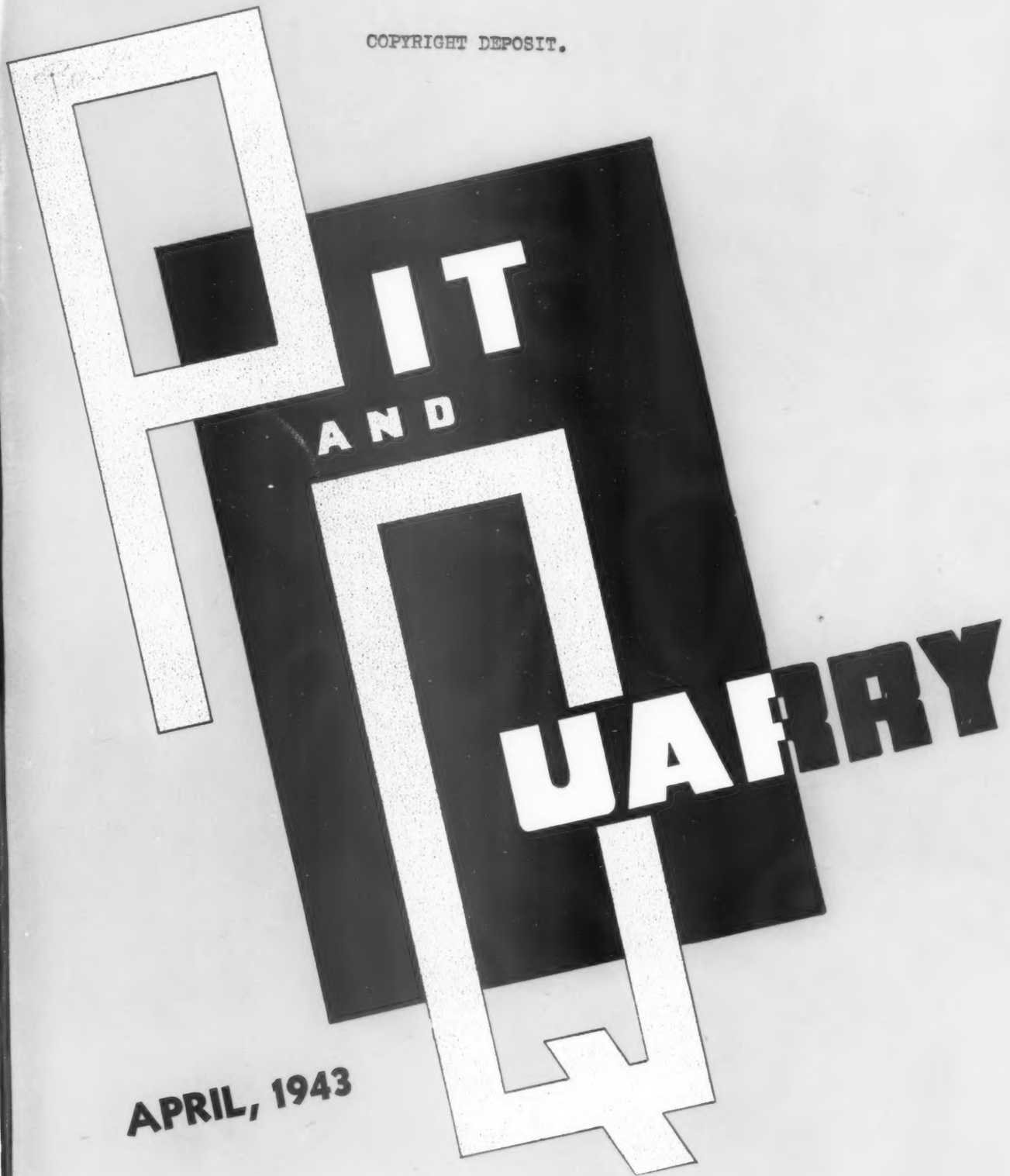


APRIL, 1943

FOR 26 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

APR 24 1943

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

●

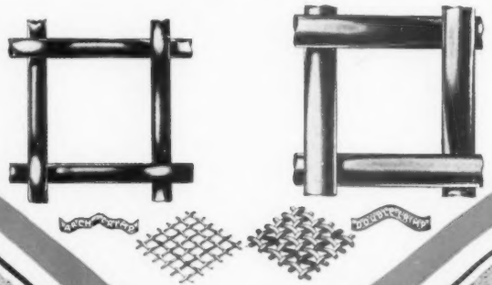
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer—

endure vibration better—

resist fatigue to the utmost



THE LIBRARY OF CONGRESS SERIAL RECORD APR 24 1943 Copy

The background at top of page shows the "Perfect" Double-Crimp Weave.

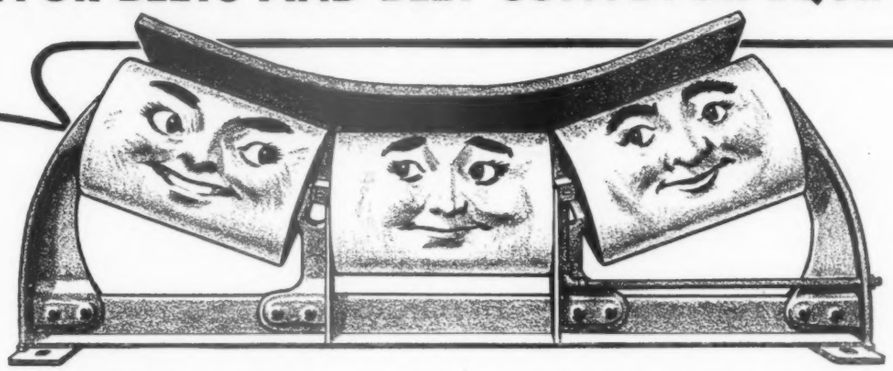
The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY
SAINT LOUIS

BROTHER, BE WISE—PROLONG THE LIFE OF CONVEYOR BELTS AND BELT CONVEYOR EQUIPMENT!

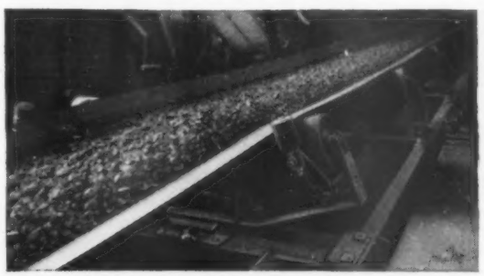


If "we" could only talk—here's what we'd say: "Operators, please give us extra special care to make us last longer. This is mighty important during wartime, because materials used in belt conveyor equipment are needed for guns, tanks, planes and other war equipment. Be wise—be patriotic—follow this advice—it will pay extra dividends in trouble-free operation."

1

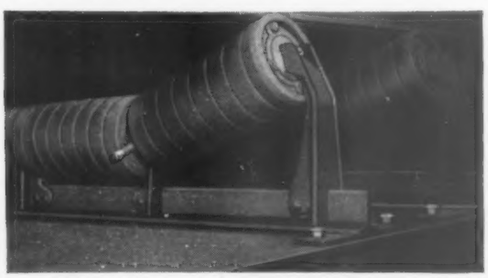
KEEP INSTALLATION CLEAN. Cleanliness plays an important part in prolonging the life of your belt conveyor equipment. Make a daily inspection to see that there is no accumulation of material that has spilled off the belt. If material is not removed it will cause the belt to drag over it as well as around the head, tail, snub and other pulleys. Consideration should also be given to cleaning the belt. The material being handled determines the type of cleaning device.

2



TRAIN THE BELT AND MAINTAIN THE TRAINING WITH SELF-ALIGNING IDLERS. It is important that both the carrying and return runs of a conveyor belt be kept practically central with its supporting idlers. This can be accomplished by properly "training" the belt on the conveyor . . maintaining that training is assured through the use of self-aligning idlers and return rolls. Link-Belt manufactures a complete line of self-aligning idlers to meet every need.

3



USE IMPACT IDLERS AT LOADING AND TRANSFER POINTS. When tons of ore, rock, coal and other materials slap a belt on the back, proper protection must be given at the loading point. The use of Link-Belt Rubber-Tread Impact Idlers definitely prolongs belt life by preventing cutting and bruising of belt . . cushioning even the heaviest blows . . thus greatly increasing belt life and protecting the belt, idler bearings and framework. Link-Belt engineers will be glad to make recommendations.

4

MAINTAIN PROPER BELT TENSION AND LUBRICATION. Eliminate excessive belt sag between idler rolls—Proper tension relieves the belt of much unnecessary wear . . Never over-lubricate idler rolls—inspection of one idler roll will often determine at what intervals equipment should be lubricated. Too much grease is as bad as too little.

AND MAKE IT A RULE to establish regular inspection periods—and make replacements with genuine Link-Belt parts when necessary. Link-Belt manufactures a complete line of idlers, pulleys, bearings, take-ups, drives, trippers, etc.

LINK-BELT
BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY

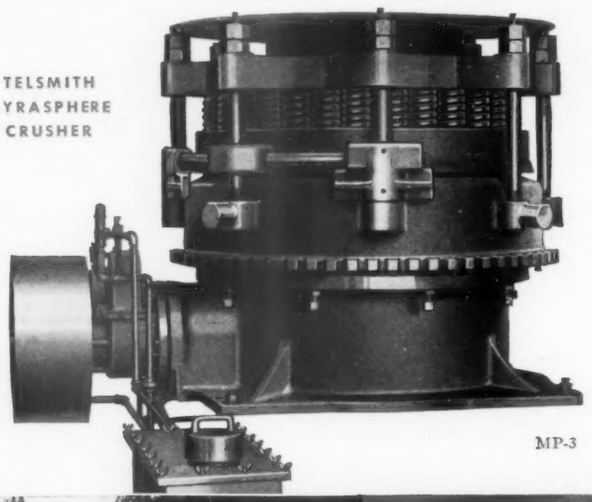
Indianapolis, Chicago, Philadelphia, Atlanta, Dallas, San Francisco, New York, Toronto. Offices, warehouses and distributors in principal cities. 9067

PIT AND QUARRY, April, 1943, Vol. 35, No. 10. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

FOR WAR WORK
Aggregate Plants
...by
TELSMITH

Like hundreds of Telsmith plants all over the world, these recent rock crushing and gravel washing plants have operated smoothly, efficiently and profitably right from the start. Most of them are doing war work, where the production pressure is tremendous. A Telsmith plant means the latest in equipment—crushers to bin gates—Telsmith-designed-and-built for extra staying power, greater flexibility and capacity, lower operating and upkeep costs. And Telsmith *Balanced* Engineering Service and centralized responsibility fits that plant to your own particular needs. *Write for Bulletin EP-15.*

TELSMITH
GYRASPHERE
CRUSHER

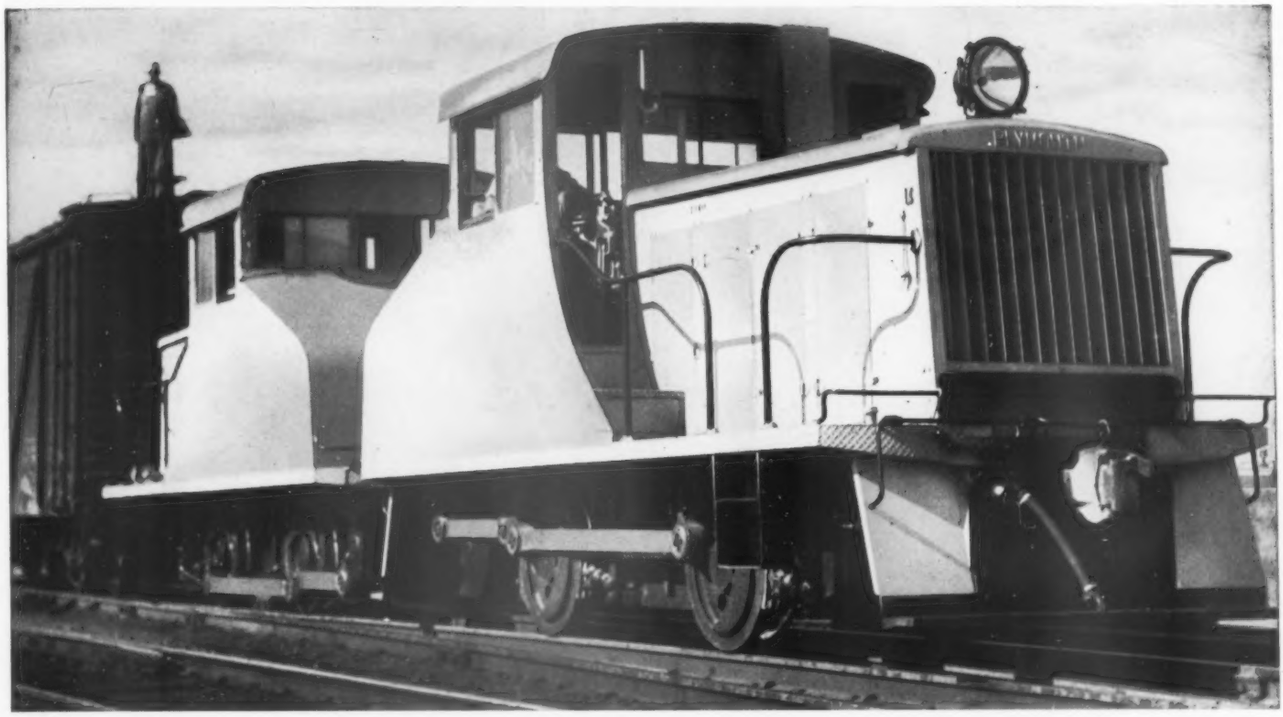


MP-3

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St. New York City
211 W. Wacker Drive Chicago, Ill.
713 Commercial Trust Bldg. Philadelphia, Pa.
19-21 Charles St. Cambridge, Mass.
G. F. Seeley & Co. Toronto, Ont.
Mines Eng. & Equip. Co. San Francisco—Los Angeles
Brandeis M. & S. Co. Louisville, Ky.
Charleston Tractor & Eqpt. Corp. Charleston, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke, Va.
Clift L. Priester 911 S. 3rd St., Memphis, Tenn.
Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn.



FLEXIBILITY and GUTS!

Type EN Locomotive Diesel Engine. One of these 340-hp units, with single-lever-control and patented fuel system, powers each of the Plymouth Locomotive Works switchers shown above.

The very name "Flexomotive" indicates the unusual flexibility of these heavy-duty, diesel-engined switching locomotives. Here, two of them are handling a heavy train. Both of those locomotives are being controlled by one operator in the forward cab! . . . Demonstrating the simplicity of control, ease of operation, and smooth performance of their Cooper-Bessemer Diesel Engines.

The C-B Diesels which power these huskies have time and again proven their ability in constant, 24-hour steel-mill switching. There is no tougher service. Direct-driving the wheels, these engines *must* be rugged . . . their diesel economy would be worthless without dependable strength.

Whatever the application . . . locomotive, stationary, or marine . . . the qualities demonstrated here are features every power user wants . . . and gets, with Cooper-Bessemer Diesels!

THE COOPER-BESSEMER CORPORATION
MOUNT VERNON, OHIO

COOPER BESSEMER EST. 1833

Cooper-Bessemer

Engine Builders since 1833

Heavy-Duty Allis-Chalmers Power Units Give You Every Advantage...Have Countless Applications

● Designed for tough tractor service, high in torque, Allis-Chalmers heavy-duty Power Units provide sturdy, substantial power for a variety of jobs. Operate smoothly on steady or intermittent loads — easily drive roll and jaw crushers, conveyors, pumps, screens, hoists, shovels, draglines, air compressors, provide power for operating repair shops, numerous other uses. Hundreds of thousands are turning out smooth, economical power on scores of applications. You get more horsepower per dollar invested — lower priced than any other engines of comparable displacement and horsepower. Fit every type of job — neat and compact in design, self-contained and protected from the elements, available with various accessories! Parts and replacements obtainable everywhere! Backed by nearly 100 years industrial power equipment manufacturing experience! A variety of sizes for every power requirement. Choice of fuels. Get all the facts . . . NOW! Write for literature.

Shift after shift, smooth operating, dependable Model L-90's keep crushers producing steadily for Knudsen-Burns, Denver, Col., (above) and Gingell Quarry, Fairfield, Pa., (below).

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE, U. S. A.

Power Units

5 SIZES...15 to 110 B. H. P.

● Gasoline ● Low Grade Fuel ● Natural Gas ● Butane

Play safe with

GULF Dieselube H.D.

. . . the new detergent type lubricating oil for heavy-duty service

High detergent action and lubricating value of Gulf Dieselube H.D. insure minimum ring sticking, minimum engine deposits and maximum protection against wear.

Years of exhaustive research by Gulf technologists have produced an improved lubricating oil of the detergent type—Gulf Dieselube H.D. (heavy duty).

Gulf Dieselube H.D. meets U. S. Army specification 2-104A for use in automotive gasoline and Diesel engines and has been approved by manufacturers of Diesel engines for tractors and trucks. Leading builders of armored tanks are using this quality oil for lubrication of engines and transmissions.

Severe heavy-duty Diesel engine tests show Dieselube H.D. keeps engines remarkably clean and gives maximum freedom from ring sticking.

This new oil is recommended for use in bus, truck, tractor, marine, and industrial Diesel installations, as well as for other Diesel engines where manufacturers recommend or operators desire a detergent type oil of the highest quality which is noncorrosive to alloy bearings.

Gulf Dieselube H.D. is also recommended for gasoline engines in commercial equipment where service encountered is extremely heavy and where ring sticking or lacquer formation has been encountered with previous oils.

For further information on Gulf Dieselube H.D., send the coupon below.

GULF INDUSTRIAL LUBRICATION

MAIL THIS COUPON TODAY

Gulf Oil Corporation · Gulf Refining Company PQ
3800 Gulf Building, Pittsburgh, Pa.

Please send me, without obligation, further information about Gulf Dieselube H. D.

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TRY THIS!

and prove to yourself that BEMIS MULTIWALL PAPER BAGS are showerproof

TAKE a Bemis Multiwall Paper Bag, filled with your cement, and set it out in the weather. Let it rain . . . let it pour! (If the air is filled with sunshine around your plant, use a hose to simulate rain.)

After you're convinced that the bag has been in more weather than it ever will have to stand in ordinary use, let it set 'til it's dry. Then open it, and see how freely the cement pours out!

Protection against sudden showers is only *one* advantage of using Bemis Multiwall Paper Bags to package your cement. You'll find that these containers are economical . . . that they have strength to reduce lost time due to breakage on the production line . . . that they have ruggedness to protect your product in transit and on the job.

We'd like to have you know about the qualities of Bemis Multiwall Paper Bags before you place another bag order. So, we suggest you try this experiment soon. We'll send sample bags for the trial, if you'll ask for them. No charge and no obligation, of course.

BEMIS BRO. BAG CO.

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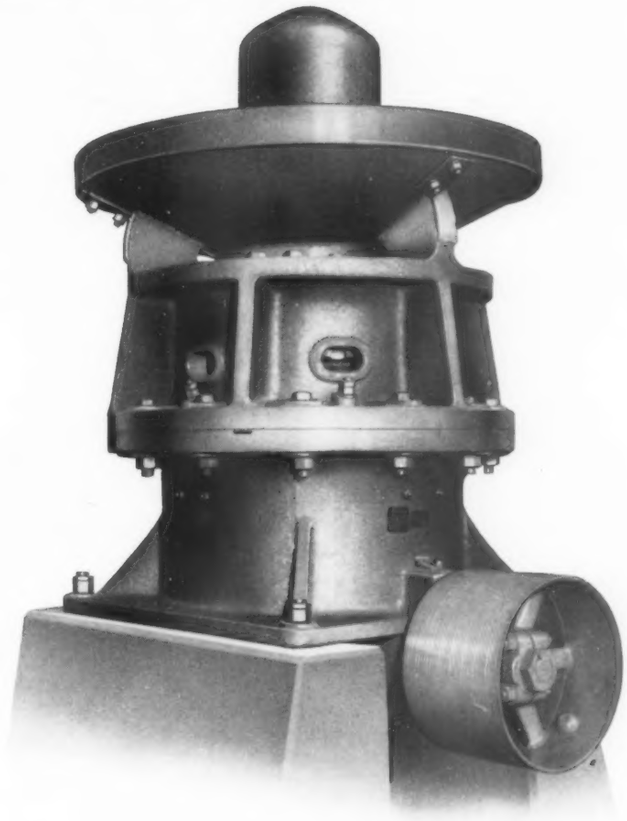
TRAYLOR

Multi-Stage FINE REDUCTION CRUSHER



The Traylor-Stearns Multi-Stage Fine Reduction Crusher is incomparable for fine crushing for several reasons—(1), being, in effect, THREE machines in one, it SIZES the initial material (in the Upper Stage), FEEDS the Lower Stage with exactly the right quantity, evenly distributed, and FINISHES the reduction (in the Lower Stage) in unusual capacity; (2) the machine cannot choke at any setting because the crushing elements are the Traylor Original Patented Non-Chokable Bell Head and Curved Concaves, which save power; (3) simple devices render adjustment easily and rapidly; (4) it is automatically lubricated and effectively protected against destructive dust and grit, and breakage by tramp steel.

The Multi-Stage is built in a range of sizes that render it widely applicable where fine product is required in large capacity. For instance, the smallest machine (size 1'-8") may be operated at 1/8" setting (closed side) and can be adjusted upward to 3/8" setting (closed side). The largest Multi-Stage at present (4'-0") may be set as close as 5/16" (closed side) and can be adjusted upward to 3/4" (closed side). The in between sizes are 2'-4" (setting range 3/16"-1/2") and 3'-0" (setting range 1/4"-5/8").

WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
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Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
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GET BULLETIN 1113

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ENGINEERING & MANUFACTURING CO.
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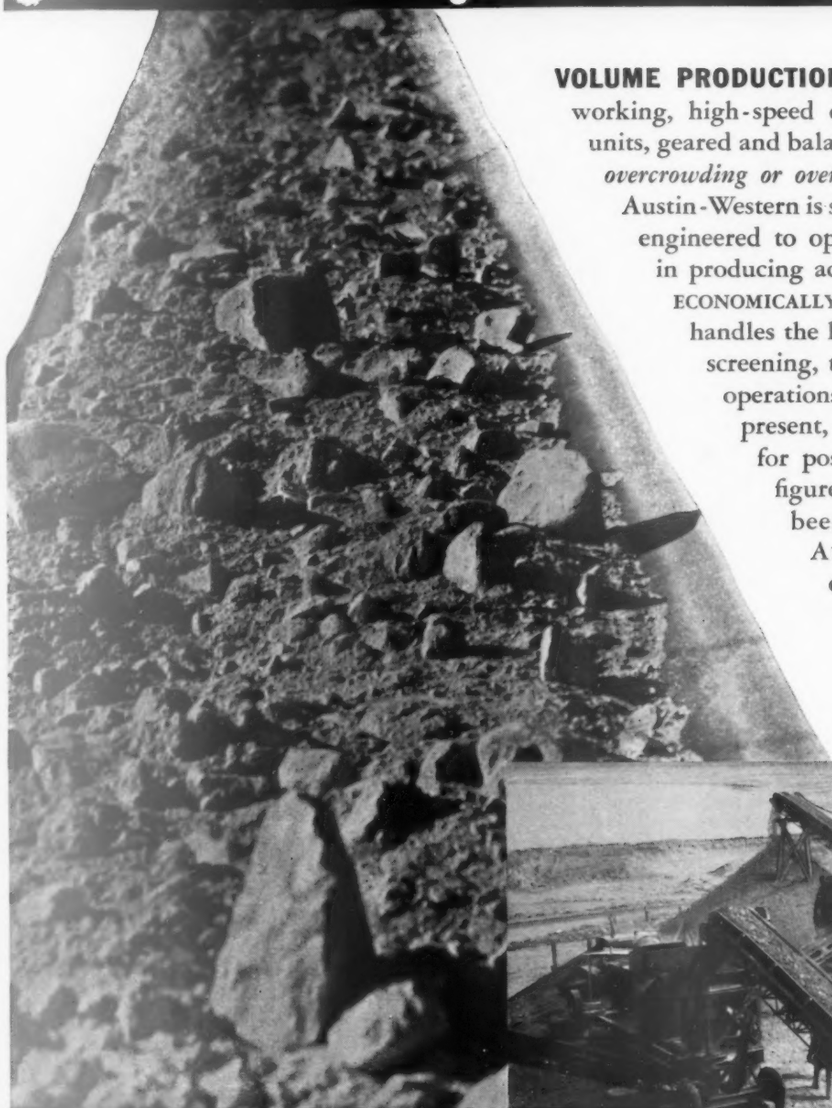
551 Howe St., Vancouver, B. C.

Export Department — 104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, San Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Autofagasta, Oruro, San Juan, P. R.

Yardage that yields PROFIT!



VOLUME PRODUCTION PAYS, but it takes a steady working, high-speed outfit. One with big capacity units, geared and balanced to operate *without fear of overcrowding or overloading*. The new Twin Unit Austin-Western is such a job. It's a two-plant team engineered to operate together (or separately) in producing accurately sized aggregate VERY ECONOMICALLY, IN EXTRA LARGE VOLUME. One handles the heavy or primary crushing and screening, the other the fine or secondary operations. Though built for war use at present, it is well to keep them in mind for post-war work. Verified tonnage figures, of plants now in use, have been extremely favorable. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois, U. S. A. Distributors in Principal Cities. Cable Address: AWCO, Aurora.

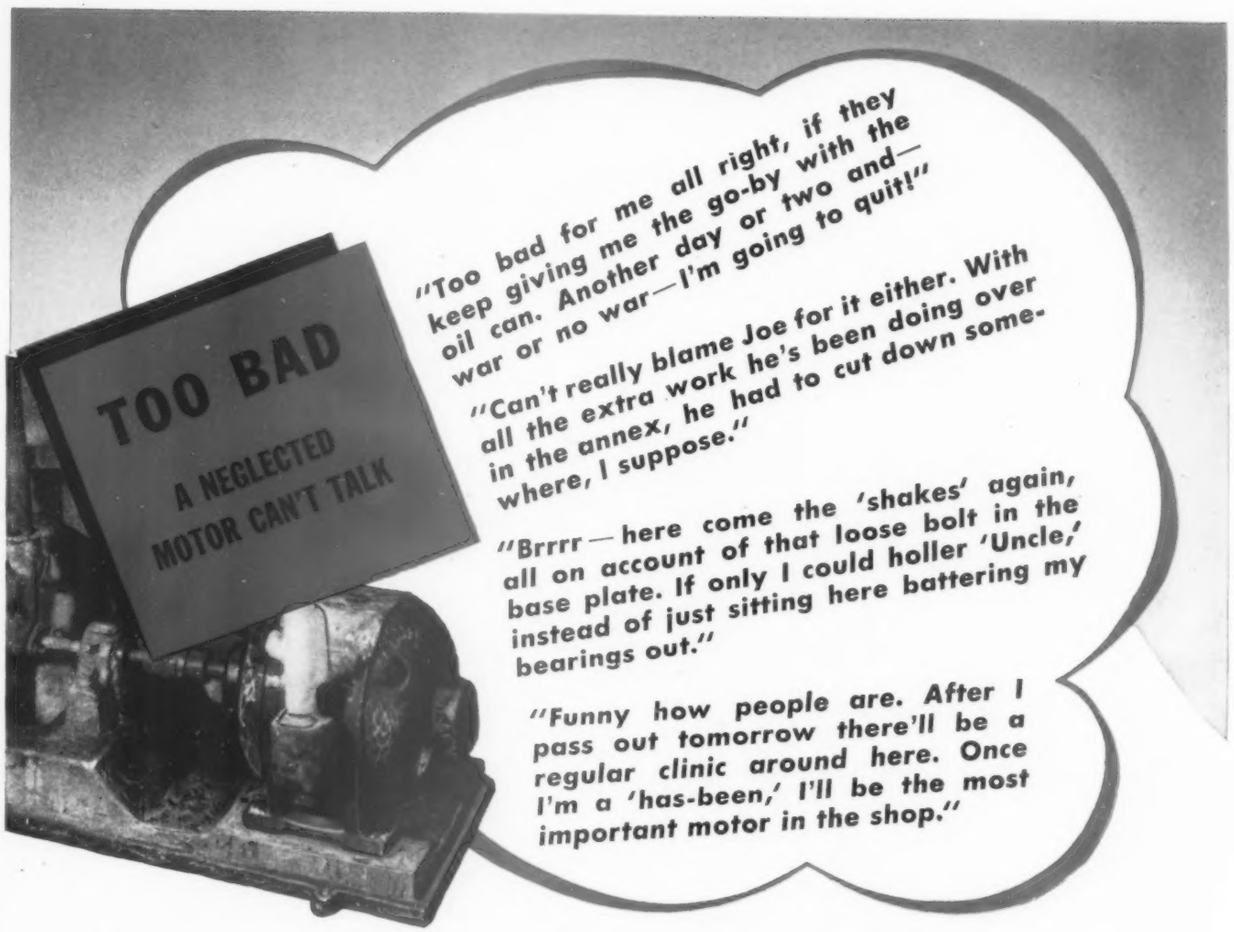
Twin-Unit teamwork on this important war job kept the stone requirements well ahead of schedule.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

Individual units to meet a wide variation of requirements are also built by Austin-Western.


TOO BAD
A NEGLECTED MOTOR CAN'T TALK
"Too bad for me all right, if they keep giving me the go-by with the oil can. Another day or two and—war or no war—I'm going to quit!"
"Can't really blame Joe for it either. With all the extra work he's been doing over in the annex, he had to cut down somewhere, I suppose."
"Brrrr—here come the 'shakes' again, all on account of that loose bolt in the base plate. If only I could holler 'Uncle,' instead of just sitting here battering my bearings out."
"Funny how people are. After I pass out tomorrow there'll be a regular clinic around here. Once I'm a 'has-been,' I'll be the most important motor in the shop."

Preventive Care of Motors

. . . IS A MANAGEMENT PROBLEM

HERE'S HOW G.E. CAN HELP YOU SOLVE IT

A regular schedule for oiling, cleaning, and inspection of every motor is half the battle in keeping motors fit.

The G-E booklet "How to Care for Motors" tells what to do and when to do it. You can use it as a basis for issuing definite instructions, and for analyzing the hours of work involved so that your maintenance crews can be adequately staffed. Ask for GEA-2856A.

To get the most out of motors, and to meet new WPB requirements, the required horsepower for every job must be accurately known. On metal-cutting operations, the new G-E MOTORULE is just what you need to determine your requirements. Simple to use, it saves time and saves motor horsepower. Ask for GEL-763.

Free G-E Motor Record Cards (GES-1526A) make it easy to keep a convenient record of the specifications and service history of every motor in your plant.

General Electric, Sec. L 750-208, Schenectady, N. Y.

Yes, please send me:

- ☐ "How to Care for Motors" (GEA-2856A)
- ☐ G-E MOTORULE (GEL-763)
- ☐ A supply of ..... Motor Record Cards (GES-1526A)

Name .....

Company .....

Address .....

City ..... State .....

BUILDER OF TRI-CLAD MOTORS

GENERAL ELECTRIC

FOR *Top* OUTPUT—

Specify

BUDA

ENGINES *from*

START TO FINISH

20 TO 340 H. P.
DIESEL, GASOLINE
BUTANE, NATURAL
GAS ENGINES . . .

THE BUDA COMPANY

HARVEY (Chicago Suburb) ILLINOIS

Of every 10 Mack trucks built ten years ago—7 are still doing duty! Here Peter Helck sketches a "baby Mack" at dock-side.

ITS MIDDLE NAME IS . . . WORK!

Today's Mack trucks range in size from tough little one-tonners to the biggest Prime Mover in Uncle Sam's Army. But big or little—if its last name is Mack, its middle name is *work!*

For 43 years, the world has watched the way Mack trucks wade into the toughest jobs in trucking. That is why the phrase "Built like a Mack truck" is a part of our language.

Mack Trucks, Inc., Long Island City, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.

Mack

TRUCKS

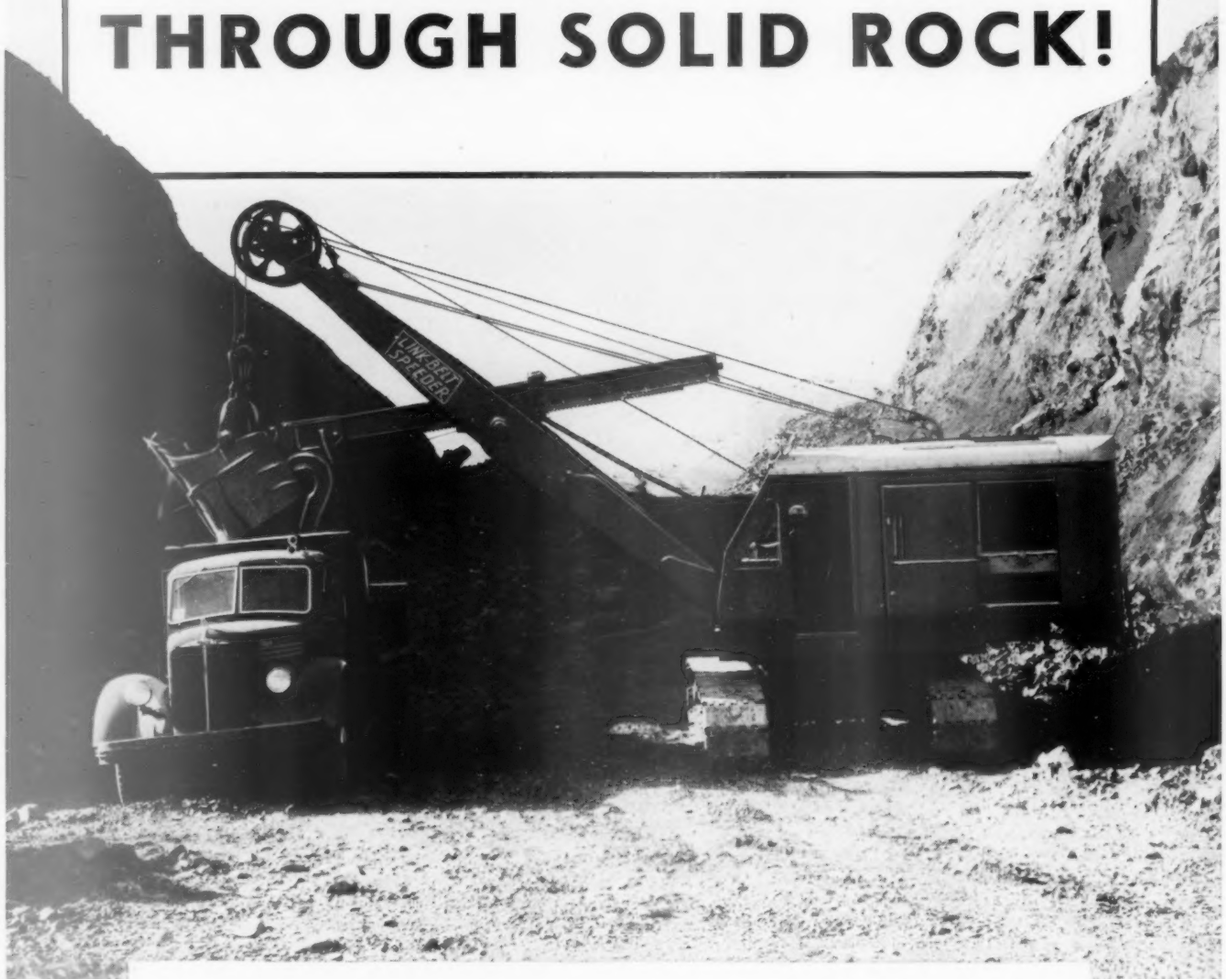
FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!

BUILDING A ROAD THROUGH SOLID ROCK!



LINK-BELT SPEEDER provides the necessary strength and stamina to provide an excellent performance record on this tough construction job near Monteur, Idaho. Highest slopes were nearly 900 feet above grade. Speed-O-Matic Hydraulic Power Control, greater stability and freedom from maintenance-delay or breakdown combine to provide day-after-day performance records with Link-Belt Speeder machines. They are engineered to provide constant, full-capacity operation quickly, efficiently and without delay.

9093

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BUILDERS OF THE MOST COMPLETE LINE OF
SHOVELS—CRANES—DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO, ILL.
(A DIVISION OF LINK-BELT COMPANY)

We take lessons from you

Chan!

YOURS is a weary task and a bleak existence, Chinese friend, as you toil on a highway for the inhuman Japs. They think themselves your masters—but they're not! For they can't enslave your soul, or break your patience, or kill your will for final victory. We take a lesson from you, Chan, as you look down the highway where victorious armies will march — your armies and ours.

For the war is over here, too—on sea and land, above and below. In open pit mines and quarries skilled men are drilling and blasting coal and ore and stone with which a war is won.

To speed the work of these determined men, and to provide for their safety, the Ensign-Bickford Company is manufacturing Safety Fuse and Primacord-Bickford Detonating Fuse.

Victory Begins Underground!

D-P

THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT

Primacord-Bickford
Detonating Fuse

This CONSERVATION PLAN

will help YOU *save man-hours . . . save materials . . . speed production*

Wartime Conservation means MORE than just conserving copper, steel, aluminum . . . it means the most strategic possible use of all of the ingredients of Victory—materials, manpower, time and ingenuity.

These five major points comprise a complete program developed by Westinghouse for Wartime Conservation. This program packages up Westinghouse engineering experience in the entire field of electric and power equipment and related materials. Examples noted are but five of many specific recommendations.

This experience and these recommendations are offered fully and without obligation. If you are not already familiar with them, consult your Westinghouse representative or send for the book described below. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. J-90478

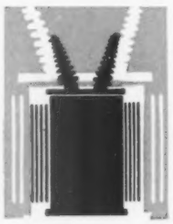
★

"WARTIME CONSERVATION," a new 100-page book issued by Westinghouse, contains complete recommendations covering the points suggested here. It will be sent you without cost, on request.

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

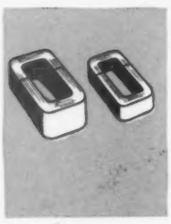
1. Conserve by strategic selection, application and use of electrical equipment.



EXAMPLE

Various accessories will produce large increases in capacities of existing equipment, with a small use of critical materials. For instance, either air-cooling or oil-circulating equipment can increase transformer capacities up to 30%. Use of both can add as much as 60%.

2. Conserve by utilizing new developments that reduce need for critical materials and man-hours.



EXAMPLE

Hipersil*—a new electrical steel—increases the flux-carrying capacity of transformer and similar cores, large and small, up to 35%. Weight and amount of critical materials can be reduced as much as 50%.

3. Conserve by utilizing available facilities for preventing breakdowns and reducing machine outages.

EXAMPLE

"Maintenance Hints" — a complete, pocket-size manual covering recommended upkeep practice for electrical apparatus——is a maintenance help available without charge. Check your Westinghouse representative for copies.

4. Conserve by utilizing materials which in many cases can replace critical materials and do a better job.

EXAMPLE

Prestite—a new pressure-molded porcelain which can be solder-sealed to metal—is replacing bushing assemblies requiring rubber or gaskets to keep out moisture, in many types of electrical apparatus.

5. Conserve by tapping all sources of salvageable scrap.

EXAMPLE

Systematic planning can uncover many ways of reclaiming worn equipment and waste material. Samples of salvage forms and organization charts in use in Westinghouse plants will gladly be made available on request.

*Registered trademark, Westinghouse Electric & Mfg. Co., for HIgh PERmeability SILicon steel.

AMERICA'S WAR PRODUCTION DEPENDS ON TANKS LIKE THESE

Take a good look at these huge spherical tanks. Chances are your hose, your belts, your packings may come from them or from others just like them.

These are used for storing butadiene in the first of the synthetic plants operated by U. S. Rubber Company . . . a second will soon be in production.

Having worked in the field of synthetic rubber since 1921 we know what uses each of the five basic types of synthetic rubber is best suited for . . . Neoprene, Buna-S, Buna-N, Butyl and Thiokol . . . U. S. Rubber uses all five types . . . knows which one to select for the performance required . . . and how to compound the specific synthetic rubber for the specific task. This experience is important to you.

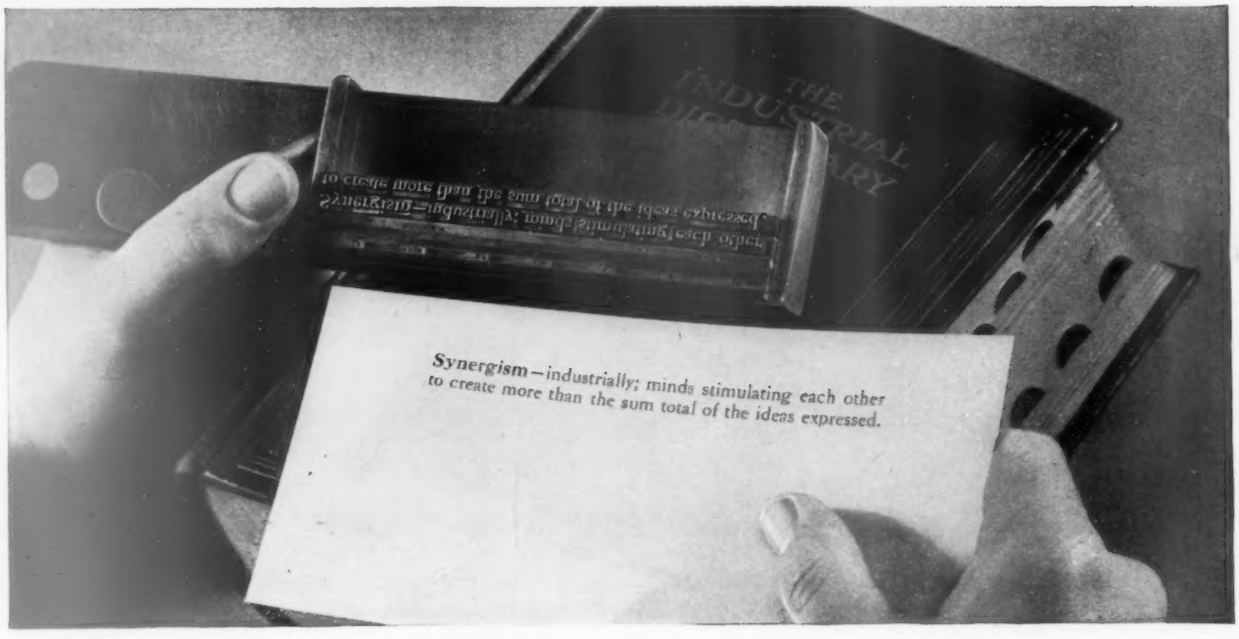
Our booklet on synthetic rubber will give you much valuable information. Send for your copy.

Mechanical Goods Division

UNITED STATES RUBBER COMPANY

ROCKEFELLER CENTER • NEW YORK

A New Definition



for the Industrial Dictionary

New ideas create new products, new methods, new words to describe them. And out of this war a word is emerging with a new meaning for future industrial progress—"Synergism."

War production has brought gigantic strides in industrial cooperation. Men have banded together to cooperate with a will-to-accomplish in a degree far greater than ever the world has known.

As minds meet to cooperate with the single purpose of accomplishment, they stimulate each other to create more than the sum total of the ideas expressed—"click to give a plus value" might be the slang for it. This is "Synergism."

Synergism is not a new word. It's an old word, with classic Greek roots meaning "working together." It long has had its meaning in chemistry, in medicine, in theology. Basically, it has always meant forces working together to develop a whole greater than the sum of the parts.

And war accomplishment has re-introduced "Synergism" with a significant meaning for Industry. It provides a name for the factor that keeps working miracles in industrial progress.

We at Atlas have been practicing synergism in our spheres of chemical production to accomplish some outstanding results in collaboration with other companies. We think our minds will "click" with yours. Let us try the experiment.

ATLAS POWDER COMPANY
WILMINGTON, DELAWARE
Offices in Principal Cities

Industrial Explosives • Industrial Finishes • Coated Fabrics • Acids
Activated Carbons • Industrial Chemicals • Ordnance Materiel

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If you care about better V-Belt performance

MAKE *this* SIMPLE TEST!

What Happens When a V-Belt Bends

FIG. 1

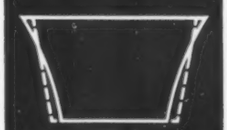

FIG. 2

433

Take any V-belt that has *straight* sides. Bend that V-belt while you grip its sidewalls between your fingers and your thumb—as shown in the large photograph above. As the belt bends, you will *feel* its sides *bulge out*—as shown in figure 1 on the left.

Now do the same thing with a belt that is built with the patented *Concave* side. You get a similar change in sidewall shape—but what a *different result!* The precisely engineered Concave side becomes perfectly *straight*—as shown in Figure 2. This belt, when bent, exactly fits its sheave groove. There is no side-bulge.

Two savings result. FIRST:—The full side of the belt *uniformly* grips the sheave-groove wall. This means *uniform wear—longer life!* SECOND:—The full side-width grip on the pulley carries heavier loads without slippage. This saves belts and power, too!

Only belts built by Gates are built with the Concave side, which is a Gates patent.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

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SYMONS CONE CRUSHERS

Used for Fine Reduction Crushing of

MANY ORES AND INDUSTRIAL MINERALS

ABRASIVES
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BRICK
BISMUTH
CADMIUM
CARBIDE
CALCITE
CEMENT CLINKER
CHROMIUM
COPPER
DOLOMITE
FELDSPAR
FLUORSPAR
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IRIDIUM
IRON
LEAD
LIMESTONE
MAGNESITE
MAGNESIUM
MANGANESE
MATTE
MERCURY
MOLYBDENUM
NITRATE
NICKEL
PALLADIUM
PLATINUM
PYRITE
QUARTZITE
RADIUM
RHODIUM
ROCK ASPHALT
SANDSTONE
SHALE
SILICA
SILVER
SLAG
SINTER
TIN
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WOLFRAMITE
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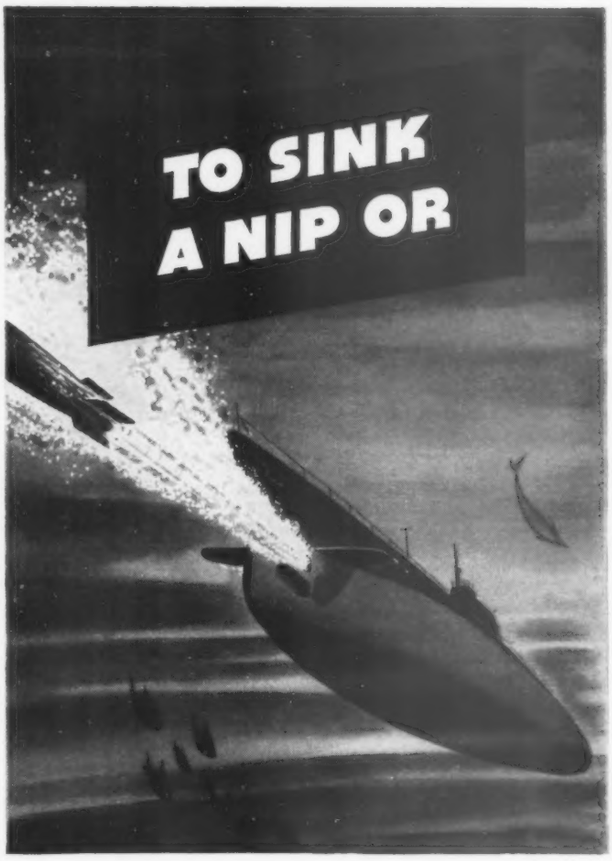
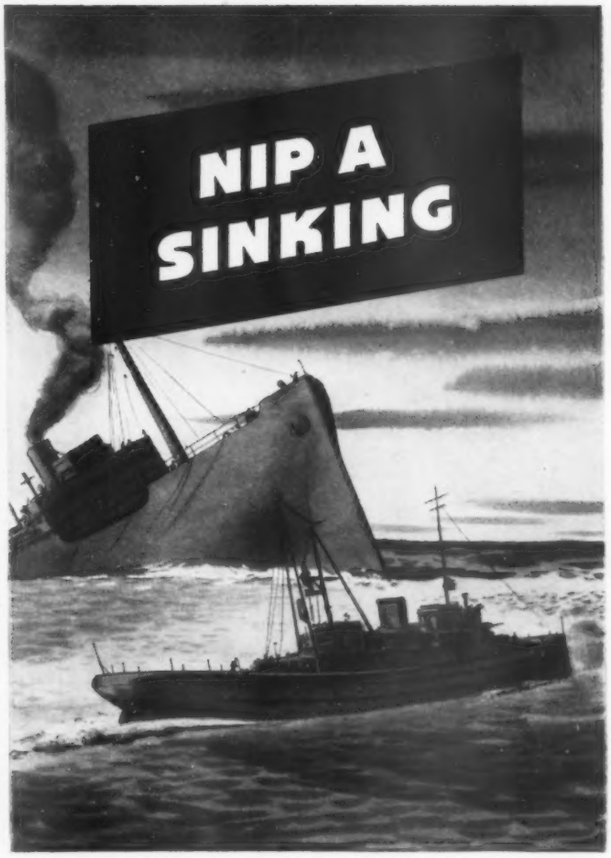
Operations which include fine crushing of these and similar materials can best be done with Symons Cones as is being demonstrated wherever finely crushed materials are produced in quantity.

NORDBERG MACHINERY

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

NEW YORK • LOS ANGELES • LONDON • TORONTO





...the Navy uses RPM DELO!

The men who fight in U. S. Navy submarines believe that Japan is entitled to half the Pacific—the bottom half! That's where they're sending thousands of tons of enemy shipping.

But this isn't a one-way war. Many of our ships have been damaged, too—and would have sunk except for rescue by one of the Navy's ocean-going tugs. These sturdy ships are vital units of the Fleet, constantly on the alert to hold down our losses by towing crippled ships to bases where they may be repaired to fight again.

Submarines and tugs of the Navy both use RPM DELO to lubricate their powerful Diesel engines. So do other types of Navy craft. Day in and day out, RPM DELO in Navy Diesels is meeting and beating some of the toughest lubricating problems in history.

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REG. TRADE MARK
DIESEL ENGINE LUBRICATING OIL

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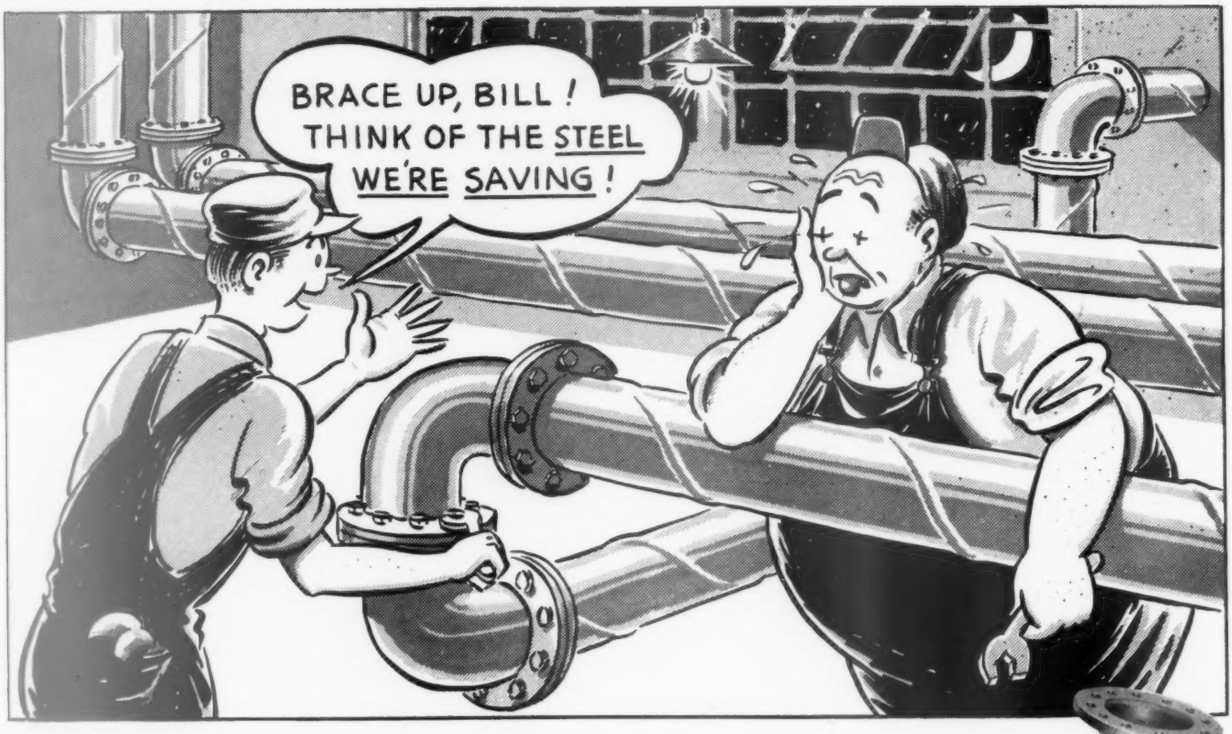
CONCENTRATE
Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity



And think of the dollars saved, too

YES, every time you can use Taylor Spiral Pipe for one of those jobs where heavier pipe has been used in the past, you conserve steel and cut costs!

And you won't have to look very far for an application for Taylor Spiral Pipe either. Listed opposite are a few of the services that have been satisfactorily and economically handled by Taylor Spiral Pipe for many years. And a full list would include many more uses. In most plants Standard Thickness Pipe is largely used for such services. It seems to have been a sort of tradition of industry to specify this heavier-than-necessary pipe for ordinary, everyday uses of this kind.

But more and more plants are breaking away from the heavy-pipe habit. They are finding that it pays real dividends—that light but strong Taylor Spiral Pipe can satisfactorily handle a big percentage of the jobs ordinarily assigned to Standard Thickness Pipe—that in many cases its installed cost is no more than half that of the heavy pipe it so well replaces.

Switching to Taylor Spiral Pipe for services like those listed is made practical by the range of sizes and variety of fittings. Thicknesses range from 18 to 6 gauge; joint lengths to 40 ft. All types of end joints, all kinds of fittings and "specials" or fabricated assemblies are produced, providing a complete service with undivided responsibility.

Change to TAYLOR SPIRAL PIPE FOR:

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- Low Pressure Steam and Air Lines.
- Steam and Diesel Exhaust Lines.
- Vacuum and Suction Lines.
- Blower Piping.
- Sand and Gravel Lines.
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- Spray Pond Piping.
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Instantaneously

SECONDS SAVED ON THE FILL INCREASE PRODUCTION . . .

Koehring Dumptors dump the load by gravity...instantaneously. Just lightly trip lever, body latch releases, and load dumps. Sticky muck is loosened by the automatic kick-out pan. It's simple because gravity has no breakdowns...no worries ...only surplus speed. This surplus speed cuts round trip time...this time saved is your surplus production. Dumping by gravity...its immediate. Nature provides no mechanical delays.

KOEHRING COMPANY
MILWAUKEE · WISCONSIN

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

TO **increase** OUTPUT

AND **conserve** EQUIPMENT

THE country expects our miners to produce more ore, and at the same time to make mining machinery last as long as possible—to avoid breakdowns at any cost.

This calls for blasting with Hercomite* or Gelamite*, the *modern* explosives that give maximum breakage for every dollar, explosives that lay the material down so that shovels or mucking machines can load speedily and without strain.

These explosives come in strengths and grades for almost all kinds of blasting. Many everyday users are obtaining satisfactory results with Hercomites and Gelamites for both surface and underground work.

The mining industry recognizes the extra efficiency and economy of these high-cartridge-count explosives, purchasing more of them than of any others.

In your own interest; in the interest of increased output; and to conserve equipment that is hard to replace; we urge you to consult us about Hercomite and Gelamite for your work.

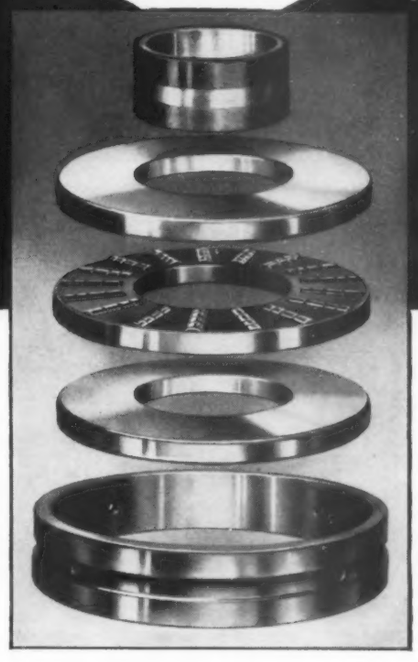
HERCULES POWDER COMPANY
INCORPORATED

*REG. U. S. PAT. OFF.

960 King Street · · Wilmington, Delaware

For Longer Thrust-Bearing Life USE ROLLWAY'S *Right Angled Loading*

All loads carried at right angles to the axis on short and staggered solid-cylindrical rollers.
NO
OBLIQUE RESULTANTS
on rollers.



THE right-angle-loading rule for roller bearings is safer to follow because it's simpler. It splits complex loads so that the two fundamental components of pure radial and pure thrust are each carried at right angles to the roller axis. NO OBLIQUE RESULTANTS tend to squeeze the rollers from between the races. Thus, in thrust bearings, rubbing contact between the roller ends and the retainer is held to a minimum. In radial bearings, there is less wear-back on the radius of the races. Friction is reduced; bearing capacity increased. You don't have to depend upon maintained oil-film for low-torque starts. The net result is smoother running, longer life, reduced service cost, and less down-time due to bearings.

IT'S A BASIC PRINCIPLE WITH ROLLWAY

- All radial loads carried at right angles to the roller axis.
- All thrust loads carried at right angles to the roller axis.

ALL ROLLWAY ROLLER BEARINGS ARE LOADED THE RIGHT-ANGLED WAY

One of the pioneer American manufacturers in the design and application of roller bearings to heavy industrial uses, Rollway has consistently specialized in the right-angled loading of solid-cylindrical roller bearings. That's because 35 years of experience has proved that no short-cut or compromise provides the same effectiveness and lasting qualities as these bearings in *pure radial and pure thrust types.*

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Rollway has developed many variations of its solid-cylindrical roller bearings in SAE and American Standard metric sizes, each having definite characteristics to meet exacting needs. Take full advantage of this wide choice of types and sizes, and of Rollway's specialized bearing experience. Just send us your design, or ask for free, confidential bearing analysis and recommendation.

ROLLWAY BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 **BEARINGS**

HELP MAKE BULLETS

The munitions of war are not made in their entirety in arsenals. They are partially produced in the forests, on the farms, in the mines. Without your products the war plant could not function. And, every piece of machinery you obtain as new equipment or for maintenance takes just that many man hours away from the actual fabrication of bullets. It's your duty to conserve every bit of working metal that is entrusted to you.

That's why proper Lubrication is of vital importance today. That is why LUBRIPLATE lubricants are attracting so much attention. LUBRIPLATE actually conditions bearing surfaces and arrests progressive wear. It prevents rust and corrosion and reduces power consumption. It possesses characteristics not found in conventional lubricants.

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"During the past three years we have handled over 25 million dollars in construction jobs. LUBRIPLATE has not only enabled us to keep our tractors and other machinery continuously on the job—but has reduced our upkeep cost at least 60 percent."

Take just one piece of equipment, your tractor. Just think what it would mean to you if you could double or treble its life, reduce replacement of parts and avoid unnecessary interruptions of service. That is what scores of tractor users are accomplishing with LUBRIPLATE.

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FISKE BROTHERS REFINING COMPANY
NEWARK, N. J. **SINCE 1870** TOLEDO, O.
WRITE FOR THE NAME OF THE DEALER NEAR YOU

"Buddy, meet an old friend"

You who use this friendly, long-life wire rope here at home can imagine what it would mean to you. Old side kicks who used to work with you are now in distant parts. If ever dependability counted in wire rope, it's doubly vital there. So when a Wickwire-rigged Liberty Ship gets through to them, and from its cargo unloads this reel with the friendly, trusted name, you can be sure it brings cheers.

The boys out there came from every American industry. They know that *you* need Wickwire Rope, too. So they're mighty thankful when you make what you have last longer, so that more can be spared for new shipping and for *their* heavy work along the fronts.

But when you do need more wire rope, please order it without reels, if lengths will permit, so our boys can have this greater convenience. Will you? Wickwire Spencer Steel Company, 500 Fifth Ave., New York, N.Y.

First Maritime M and Victory Fleet Flag in all New England was awarded to Wickwire for outstanding production achievements.

DO YOUR MEN UNDERSTAND STRETCH?

The free book, "Know Your Ropes," tells them just what to expect, and what to look out for. In addition it pictures splicing methods, life-extension rules, etc. This book can save you money—and save wire rope for the war fronts. Send for your free copy.

SEND YOUR WIRE ROPE QUESTIONS TO WICKWIRE SPENCER

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WISSCO PRODUCTS

WAR begins with AGGREGATE!

655,000 TONS
roll out of this
ONE IOWA MOROK PLANT
for
M. O. WEAVER, Inc., Des Moines, Iowa
— all for the War Effort!

WAR begins with aggregate! It is the basis of every foundation — for plant expansion, for flying field, for cantonment, for arsenal and hospital.

M. O. Weavers Morok plant is one of the many Iowa Cedarapids portable crushing plants that is producing for Victory. 655,300 tons of material rolled out of this plant in 1942 in spite of the fact that it was moved four times from widely divergent points. The monthly average output for the periods when the plant was actually on the job location, was 73,000 tons. That is enough material to provide 25 runways 200 ft. wide, a mile long and 6 inches thick.

Output like this gives you some idea what it means to have an Iowa Cedarapids plant — it means a smooth running job, free from hitches and giving easy portability when you are faced with a move — Iowa Cedarapids plants keep-a-runnin'.

These are things that are going to be mighty important after the "Duration". They are going to play a real part in the success of post war contracts. The Iowa line is complete and can be engineered to meet any aggregate production problem either from the standpoint of output or character of materials for either an entire plant or any part of a plant.

Come to Headquarters for Aggregate producing equipment.

IOWA MANUFACTURING CO. **Cedarapids** **Built by IOWA** **Cedar Rapids, Ia**

ROTARY KILNS

OUR ROTARY KILNS
in the
WAR PROGRAM
PLAY AN IMPORTANT PART
IN THE MAKING OF

MAGNESIUM
MANGANESE
ALUMINUM
DOLOMITE
CEMENT
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NICKEL
LIME
IRON
TIN

F. L. SMIDTH & CO.

60 EAST 42ND STREET — CEMENT ENGINEERING CEMENT MACHINERY — NEW YORK, N. Y.

KENNEDY STONE PREHEATER AND DEHEATER

Saves in Lime Production

40% SAVINGS IN FUEL
20% INCREASE IN CAPACITY

Plus
A Better Product!

It has been known for many years that better lime could be made in rotary kilns than in vertical kilns, but at a considerable handicap in price.

The great length of former types of rotary kilns, sometimes exceeding 400 feet, has failed to solve the problem of efficiently reducing the temperature of the exit gases.

Now, thanks to the KENNEDY principle of preheating and deheating, it is possible to make a high-grade lime of better quality than was formerly obtainable in long or short kilns at greatly reduced cost of production.

This principle permits the effective recovery and use of the exit gases, and in actual operation has shown 40% saving in fuel, with capacity increased 20% and more.

Short kilns employing the KENNEDY method also acquire an internal glaze which lessens the wear on kiln liners, lowers the power requirements, and reduces the formation of kiln rings.

Overburned and underburned lime is practically eliminated. Coal feed and lime calcination are switchboard controlled.

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Also Manufactures
CRUSHING, SCREENING, AND ELEVATING EQUIPMENT
Pneumatic Transport Systems
Pulverized Coal Equipment
and
STEAM GENERATORS
Write for one of our Engineers to call.

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DIVIDEND-PAYING EQUIPMENT FOR THE CEMENT PLANT

FULLER-KINYON CONVEYING SYSTEMS
AIR-QUENCHING CLINKER COOLERS
ROTARY COMPRESSORS AND VACUUM PUMPS
FINISHED CEMENT COOLER
THE AIRVEYOR FOR CONVEYING CRUSHED COAL TO PULVERIZERS AND DRYERS
REMOTE-CONTROL UNLOADER FOR CONVEYING BULK CEMENT FROM STORAGE BINS TO BOX CARS, HOPPER-BOTTOM CARS, AND PACKER BINS
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PIT AND QUARRY

Vol. 35 APRIL, 1943 No. 10

CONTENTS

News of the Industry 33

The Victory Program . . . and Your Business 38

Editorial: Absenteeism in Industry 43

New Gravel Plant's Output Averages 600 Tons Hourly 44

That Junk Heap Can Furnish Material to Keep Your Equipment in Operation 52

Barney-Car System Helps Trucks Up Incline from Quarry Floor 56

Erects Efficient 50-Ton Plant to Process Gravel on Own Farm 58

Recent Shifts in World Trade Channels of Phosphate Rock 60

New Tile Plant Across Road from Old Reflects Progressive Spirit of Owner 74

Tips on Maintenance for Ready-Mix Operators—I 78

New Books 61
Personal Mention 62
Legal Decisions 64
Traffic News Digest 68
Trade Literature 69
New Machinery and Supplies 69

MEMBER AUDIT BUREAU OF CIRCULATIONS

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

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gives the utmost direct-firing efficiency

WITH THIS "VICTORY FUEL"

With gas and oil largely confined to military needs, the increased use of **coal** puts the spotlight on the Raymond BOWL MILL as today's best answer to the problem of firing rotary kilns and industrial furnaces.

It has wide range capacity and handles any grade or moisture coal. It maintains uniform grind at all rates of feed. It will operate on a 24-hour basis, month after month, without shutdowns. With the panel board control, very little attention is required from the operator, and one man can easily take care of a battery of Bowl Mills.

For direct-firing cement, lime, dolomite kilns, and industrial furnaces, the Bowl Mill will pay back its investment cost in extra economies.

Write for Raymond BOWL MILL Catalog Number 43

SINCE 1887

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COMBUSTION ENGINEERING COMPANY, INC.

1321 North Branch Street **CHICAGO**

Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

Buell Dust Recovery Systems help put it there

High Explosives are "booming" these days. America's arsenals are turning out astronomical quantities of bombs, shells and torpedoes...every one with a deadlier-than-ever "boom" for our enemies.

Sulphuric acid is important in the manufacture of explosives, but absolute purity of the acid is essential. Buell Dust Recovery Systems are used in conjunction with the contact method of making sulphuric acid because their high efficiency in removing contaminating flue dust from the sulphur dioxide gas assures purity in the finished product.

This is just one of many ways in which versatile Buell Dust Recovery Systems are helping industry achieve its war production goals by preventing contamination and salvaging critical materials for re-use. The van Tongeren "shave-off"—an ingenious design feature found only in Buell cyclones—insures exceptionally high collection efficiency, low operating cost and long life. Buell cyclones have no moving parts and require little or no maintenance or attention.

Buell Dust Recovery Systems easily handle high temperature gases, and can be installed for any desired capacity from 300 c.f.m. up.

Factual 28-page book. Write for Bulletin R-43.

Memo to:
ROCK PRODUCTS INDUSTRY
Buell Dust Recovery Systems offer outstanding advantages in efficient economical operations in conjunction with
Pulverizers
Kilns
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and other operations.
Buell installations are in wide use throughout the rock products industry. On the list of Buell users are such well-known names as Dewey, Kosmos, Lehigh, Lone Star, Medusa, Standard Lime & Stone...and many others.

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DUST RECOVERY SYSTEMS

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BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

PIT AND QUARRY

CHICAGO APRIL, 1943

Bauxite Workers Are Allowed Increase in Basic Wage Rates

A general increase of 5 cents per hour was unanimously authorized by the National War Labor Board on March 11 for the approximately 1,100 workers at the Republic Mining & Manufacturing Company, which is the Bauxite, Arkansas, plant of the Aluminum Company of America. September 20, 1942 is to be the effective date for the increase. The Aluminum Workers of America, CIO, is the collective-bargaining agent for the employees.

The WLB approved the 5-cent increase for the bauxite mine and plant workers in order to remove the inequality which resulted from grants to other Alcoa plants, prior to wage stabilization. The company's past practice has been to give uniform general increases to the three plants, maintaining a differential of 6 cents between the bauxite plant and the other two plants.

Construction Awards Continue to Decline

The total valuation of construction contracts awarded in the 37 eastern states aggregated $393,517,000 during February, according to the F. W. Dodge Corporation. This compares with $350,661,000 in the previous month and $433,557,000 for February 1942. Construction for public ownership represented 92 per cent. of the total for the month.

Strike Slows Output at Indiana Stone Plant

A strike at the quarry of the Ralph Rogers Stone Company near Silverville, Indiana, the latter part of February for several days stopped the flow of crushed stone used in road building and for floors in buildings at the Burns City Naval Ammunition Depot. Pickets patroled the strike-closed quarry.

The work stoppage affected approximately 200 truck drivers and laborers and followed a meeting in Bedford, Indiana, in which members of three AFL unions voted to strike.

The three unions involved were the International Brotherhood of Teamsters, Laborers, and operating engineers.

Noted Cement Engineer Ferrying War Planes

W. R. Bendy, well-known cement engineer of Claverack, New York, is now a second lieutenant in the Army Air Force. He holds the rating of service pilot in the Sixth Ferry Group of the Air Transport Command.

Lieutenant Bendy completed three months of advanced flight training in September, 1942, and has since flown as a bombardier training pilot, a flexible gunnery pilot and, more recently, as a ferry pilot.

He is, of course, unable to handle further commissions as a cement engineer for the duration but reports that he plans to return to his business again at the end of tne war.

Lehigh Cement Closes Plant at Mitchell

William H. Weitknecht, superintendent of the Lehigh Portland Cement Company plant at Mitchell, Indiana, announced on March 9 that the plant would halt production and that the 290 employees would be laid off indefinitely.

Just when the plant would reopen would depend upon orders received, Mr. Weitknecht said. He explained that all of the plant's storage bins were full and that the supply on hand was sufficient to take care of anticipated shipments for several months.

Cement Production Leveling Off; See Good Future Demand

Cement production in January, 1943 was slightly higher than in the same month last year (12,560,000 barrels against 12,360,000) but shipments dropped 5 per cent. from 9,115,000 barrels to 8,641,000 barrels. Apparently the critical production period for the cement industry has passed and the strong uptrend which began nearly three years ago in leveling off. Stocks have improved but are still below a normal operating level although the improvement from the badly depleted condition which existed last October has been noticeably improved.

On October 22, 1942 the Facility Clearance Board and Facility Review Committee were organized in the War Production Board to review construction already contracted or underway and also to approve all proposed construction. Up to March 4, stop orders were issued on approximately $1,350,000,000 of construction, much of which was of the heavy type that would have required large quantities of cement. Although having adverse effects at present, this deferred building is providing a backlog of business for the cement industry during the period immediately following the end of the war. On the other hand, these committees up to March 4 have approved slightly more than $1,000,000,000 of construction.

Issuance of the amended General Limitation Order L-179 of the War Production Board on February 16 removed the ban upon assignment of bin space to customers and no longer requires that tests of cement must be made only by the National Bureau of Standards or a Standards-approved laboratory. The three types of Portland cement that may be manufactured, as specified in the original order, remain unchanged.

U. S. Gypsum Spent $1,115,000 on Plant Additions in 1942

The United States Gypsum Company and subsidiaries reported net profits for 1942 of $5,652,316, equal after dividends on the 7-per cent. preferred stock to $4.27 a share on the outstanding common. This compared with net of $7,033,629, or $5.42 a share on the common, in the year preceding.

The report, which was signed by Sewell L. Avery as chairman of the board, drew attention to the withdrawal of the criminal case proceedings instituted by the government under the federal anti-trust laws. Of the suits which were pending when the 1941 report was prepared, Mr. Avery said:

"During the year 1942, after many months of legal effort and the expenditure of a substantial amount in preparing the remaining criminal case for trial, and only a few weeks before the trial was to begin, the government, on its own motion, dismissed the suit. The civil suit, commenced in Washington, D. C., in August, 1940, is still pending against the company.

"The War Department," Mr. Avery added, "under the federal statute authorizing renegotiation of contracts, has asked for data relating to the company's 1942 operations. We believe the effect of any such renegotiations will be insignificant."

"The drastic governmental restrictions on all types of building activity make the outlook for 1943 volume uncertain and unfavorable."

Expenditures for plant additions and improvements in 1942 amounted to $1,115,092. After payment of $2,940,300 in dividends on the preferred and common stock, the balance carried to surplus raised earned surplus to $30,371,753 as of December 31, 1942. A year earlier, the total was $26,889,409.

Paid Circulation of Pit & Quarry Among Nonmetallic - Mineral Producers in Recent Years:

CONTINUOUSLY FOR 26 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

1942	(November)	6,650
1942	(May)	6,513
1941	(November	6,179
	(May)	5,945
1940	(November)	5,397
	(May)	5,037
1939	(November)	4,641
	(May)	4,617
1938	(November)	4,496
	(May)	4,366
1937	(November)	3,971
	(May)	3,772
1936	(November)	3,654

82% increase in 6 Years

Colorado Firm Working Vermiculite Deposits

The AleXitE Engineering Company, headed by J. Don Alexander and D. M. Alexander, president and vice-president, have undertaken the operation of a half section of vermiculite and manganese land in the Powderhorn district of Gunnison County, Colorado.

Operations are now going on and the vermiculite, known as "AleXitE," is being shipped to the processing plant in Colorado Springs. Manganese is being shipped to the Metals Reserve Company in Salida, Colorado.

A complete camp to house sixteen people has been installed on the property and mining machinery together with three bulldozers, trucks and other vehicles are now in use for the further opening of the mine.

Research is carried on at the Colorado Springs plant to develop a number of products from vermiculite, including fireproof, insulating building materials, paint, lubricating material, a plant-growth stimulant, plastics, and others.

At present there are about 40 people on the payroll.

Fluorspar Shipments Increase 12 Per Cent.

Despite labor and other difficulties, production and shipments of fluorspar in 1942 were 8 and 12 per cent greater than in 1941, the previous record year, according to final 1942 figures made public by the Bureau of Mines.

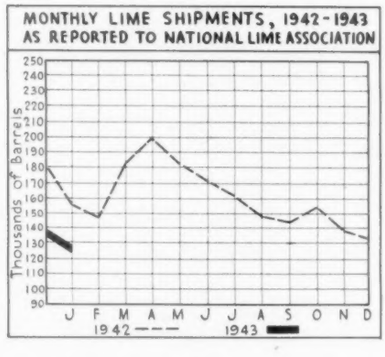
Production of fluorspar totaled 337,000 short tons in 1942 compared with 313,000 tons in 1941. The Illinois-Kentucky district accounted for 79 per cent. of the total in 1942, as compared with 86 per cent. in 1941.

Steel mills, the Bureau reported, are the principal consumers of fluorspar, but much larger quantities were used in 1942 in the production of hydrofluoric acid, which is essential in the manufacture of artificial cryolite and aluminum fluoride, aluminum raw materials. The glass industry ranks third in importance as a consumer of fluorspar but it used less than in 1941. The enamel industry, which formerly ranked fourth, dropped to sixth place in 1942.

ASTM Inspection of Cement-Testing Laboratories Begun

The Cement Reference Laboratory, a joint project of the National Bureau of Standards and Committee C-1 on Cement, American Society for Testing Materials, is now preparing for its eighth inspection tour among cement testing laboratories. This new tour is intended to serve those laboratories which are engaged in, or expect to be engaged in the testing of cement for federal, state, or defense projects. Laboratories in that classification, which desire to avail themselves of this inspection service, should address their request therefor to the Cement Reference Laboratory at the National Bureau of Standards, Washington, D. C. Applications should be filed very promptly because itineraries will be prepared at an early date. The proposed tour will very probably provide only one opportunity for the inspectors to visit a given laboratory during the next two years.

It is very important that, prior to reinspection, a laboratory will have remedied those deficiencies in apparatus and methods which were reported in earlier inspections. Laboratories should refer to the written confirmatory reports of their last inspection and then mention the improvements which have been made.



According to data collected by the National Lime Association, 55 companies in January, 1943, shipped 122,963 tons of lime (94,136 quicklime; 28,827 hydrate). Reporting companies represent 36.2 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 375,000 tons. Shipments of lime by users for January, 1943, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	136	2,049
Building	8,766	9,551
Chemical	85,234	17,227
Total	94,136	28,827

Midwestern Gravel-Plant Heads Discuss Priorities, Man Power Problem, Car Situation

At a special meeting of members of the Illinois Sand & Gravel Association, held at the Palmer House in Chicago on March 18, a number of subjects of interest to producers were discussed. In the absence of Edward W. Bauman, chief of the Non-metallic Section, Mining Equipment Division of the War Production Board, who was scheduled to be present but was finally unable to leave Washington, Vincent P. Ahearn, executive secretary of the National Sand & Gravel Association, talked to those present about priorities, the manpower drain on these industries, etc.

Mr. Ahearn said, in answer to questions, that Form 731, required for the purchase of new equipment covered by Limitation Order L-192, should be filed with Mr. Bauman in Washington and that he should be informed at the same time that Form 556 had been filed with the regional office of the WPB in the area in which the plant of the purchaser is located. If the equipment is not a motor truck and is not of the types covered by L-192, only Form 731 need be filed.

He also said that lumber purchased by producers is not chargeable to their mining quotas, but is acquirable with an AA-5 priority rating under the lumber order.

When quotas are assigned, producers will receive a detailed statement of what can be obtained and also an allotment number which must be used on all purchase orders beginning April 1. The ready-mixed-concrete industry, he remarked parenthetically, will receive an AA-2X priority rating for repair parts but will not be assigned allotment numbers.

After April 1 there will be a ceiling on operating supplies as well as on maintenance and repair items, according to Mr. Ahearn.

With reference to the induction of sand-and-gravel workers into the armed forces Mr. Ahearn said that, in the cases of all essential employees between the ages of 18 and 45 years, it is advisable to file Form 42 B with the local draft boards before the men affected are inducted, as protests filed after their induction are almost certain to be rejected. As for the men from 38 to 45 years of age, he believes that it is advisable to file for their deferment long before they are reclassified.

He referred to a telegram sent by Collis Stocking, associate director, Bureau of Program Planning and Review of the War Manpower Commission, to the National Crushed Stone and National Sand & Gravel Associations on March 10. The message read as follows:

"Regarding your request, War Manpower Commission's Committee on Essential Activities has not included the production of crushed stone, sand, and gravel in its list of essential activities. However, the committee clearly has excluded the production of these items from list of nondeferrable activities and occupations recently released. Would urge that employees of your industries remain on their present jobs except those specifically listed as nondeferrable until such time as an official announcement is received of change in status of this activity."

Mr. Ahearn thought that this telegram might prevent "raiding" for workers by the United States Employment Service.

A quick survey among the producers present revealed some interesting facts on this subject. The average age of the production employees appeared to lie above 40 years, and most of the companies represented have relatively few workers younger than 38 years. Comparatively few important men have been lost to the services.

Only two companies are using women as substitutes for men, and then only on light work, such as shipping scales, timekeeping, etc. One company uses women to operate portable loaders.

On the open-top car situation Mr. Ahearn said that the shortages reported are "spotty," but that a crisis is expected to develop later. Members were urged to report cases of car shortages to the national association's headquarters in Washington.

Extension of the 48-hour-week order of the War Manpower Commission to other areas will involve sand-and-gravel producers who employ 8 or more workers in those localities. Concerns engaged in interstate commerce and, for that reason, operating under the Fair Labor Standards Act will be required to meet all the provisions of that law with respect to overtime, etc., in so far as their workers engaged on work for interstate commerce are concerned. Likewise, those operating under the Walsh-Healey act must continue to observe its provisions.

Opposes Government Dolomite Project on Drummond Island

Senator Alexander Wiley of Wisconsin has asked government officials to investigate deposits of dolomitic stone available in Wisconsin, Michigan, Ohio and Illinois for use in lime plants. In letters to Chairman Donald M. Nelson of the War Production Board and S. H. Husbands, president of the Defense Plant Corporation, Senator Wiley made the following appeal:

"Recently my attention has been directed to a proposal which, I understand, has been made to the Defense Plant Corporation requesting a loan to finance the moving of quarry equipment and the completion of dockage facilities at Drummond Island, Michigan, to provide dolomitic limestone for use by lime plants at Ludington and Detroit, Michigan.

"I am further advised that there are ample deposits of high-quality dolomitic stone in Michigan, Ohio, Illinois and Wisconsin, which are available without the use of additional critical materials for plant construction or any additional manpower.

"In the interest of government economy and the elimination of any unnecessary use of critical materials and services, I respectfully request that this project and any similar project be investigated carefully before any action is taken."

Kirkwood Gets Contract for Kansas War Project

The Rock Hill Stone & Gravel Company, of St. Louis, through its subsidiary, the Kirkwood Sand & Gravel Company, has been awarded a contract from the United States government for furnishing a substantial amount of sand and gravel for a government project in southwest Kansas, and is expanding its facilities at Sterling, Kansas, to produce the material in that area.

H. E. Billman, president, reports the company has purchased a farm lying southeast of Sterling and has a third dredge boat under construction to produce sand and gravel from the new deposit.

A net income of $534,153 or $1.89 a share was disclosed in the audited statement for 1942 by the Missouri Portland Cement Company as against $623,273 or $2.20 per share in 1941.

Spodumene Plant to Be Rebuilt After Destruction by Fire

Rebuilding of the spodumeme plant of the Black Hills Tin Company, at Tinton, South Dakota, which was recently destroyed by fire, will be undertaken as soon as possible, Earl Schultz, superintendent of the mine, has announced. The plant and $75,000 worth of new machinery burned on January 5. The total loss was estimated by company officials at $500,000. The fire was started by an explosion in the drier room and swept rapidly through the entire building. Many improvements had been added during the last eight years and the mine was fast becoming one of the outstanding spodumeme scources in the United States. The company had recently installed $75,000 worth of new government-financed machinery which was to have been placed in operation on January 6, the day after the fire.

Geologist Recommends State-Owned Plants

Before referring a bill to create a State Public Products Authority to a subcommittee, the agriculture committee of the South Carolina House of Representatives was told by Professor F. H. Calhoun, Clemson College geologist, that a profitable state-owned-and-operated lime and cement industry could be established near Holly Hill or Jamestown.

"A state-owned plant could compete easily with Tennessee cement-manufacturing establishments," Professor Calhoun declared. "The only difficulty," he said, "is the question of priorities on plant equipment."

Professor Calhoun told the committee that an "up-to-date cement-manufacturing plant would cost in the neighborhood of $3,000,000, an up-to-date agricultural-lime plant would cost less than $50,000 and an up-to-date plant for making builders' lime would cost about $100,000."

Omaha Operators Win No-Accident Awards

Safety awards were presented Omaha concrete and sand-and-gravel concerns recently during the Omaha Safety Council's drive to "Smash the 7th Column"—the carelessness which causes accidents. Highlighting an all-day industrial conference, the awards were presented to the Ready Mixed Concrete Company and the Lyman-Richey Sand & Gravel Corporation among some 60 other firms winning similar awards for fine records during the past six months.

In Industrial Division V the Ready Mixed Concrete Company, with 30 employees averaged 39,162 hours with no accidents. The Lyman-Richey Sand & Gravel Corporation in the same classification reported 28 employees working 34,960 hours with no accidents.

Manleys Lease Sand Plant in Wisconsin

J. N. Thouvenell, owner of the Portage Sand Company, with plant and office located just south of Portage, Wisconsin, has announced the lease of the firm's facilities to Manley Brothers, operator of plants in Missouri, Illinois and Dousman, Wisconsin.

The concern has handled nearly half of the output of the Portage firm for the last 20 years and the company plans to install considerable equipment in addition to that already running at the pits near Portage.

Providence Producer Killed by Cave-In

Domenic Cardi, 65, owner of a sand-and-gravel business at Providence, Rhode Island, was killed recently when buried under tons of sand which had broken away from an overhanging 60-foot cliff and buried him. Only his arm was visible at the bottom of the cliff when discovered.

A touching scene was enacted at the scene when the Rev. Rolando Cardi, assistant pastor of St. Ann's Church, intoned the last rites of the Roman Catholic church over the body of his father.

Jury Decides Suit in Gravel Firm's Favor

The West Virginia Sand & Gravel Company at Charleston, West Virginia, obtained a verdict of $400, awarded by a circuit court jury in that city February 10, in its suit against the T. C. Staples Construction Company, McHugh Brothers, and the American Surety Company.

The plaintiff sought to collect for materials it claimed to have sold to the defendants.

The Silica Sand Company, Inc., of Detroit has filed notice with the Michigan Corporation and Securities Commission of a change of name to the Rockwood Silica Company.

Start Production at Mississippi's First State-Owned Crusher

The first of the state-operated limestone-crushing plants in Mississippi was opened at a location west of Brandon recently with a demonstration of crushing and proper methods of spreading. Si Corley, commissioner of agriculture in Mississippi, said that more units are expected to be added as the program progresses in the state. The material will be made available to farmers at cost.

Mr. Corley spoke briefly on the history of the state's effort to operate similar plants about 30 years ago when old equipment and convict labor was used. The new plant, he said, was established after authorization of $30,000 by the legislature for the erection of plants in limestone-formation sections of the state.

Vulcanite Plant Sold to N. Y. Scrap Firm

Described as one of the largest Salvage projects of its kind in the country, the War Production Board announced March 6 the sale of an abandoned cement plant near Phillipsburg, New Jersey, to be scrapped in the war salvage campaign.

The plant, owned by the Vulcanite Portlant Cement Company includes 34 buildings, with industrial equipment, including rails, motors, generators, driers, blowers, boilers and tools. It was estimated that 14,000 tons would be obtained when the dismantling is completed.

The special-projects branch of WPB coöperated in the transfer of title from the cement company to the Heat & Power Company of New York, the dismantlers. It was stated that all usable equipment would be sold to plants which could put it to immediate use.

To Convert Bulk-Cement Cars for Oil Transport

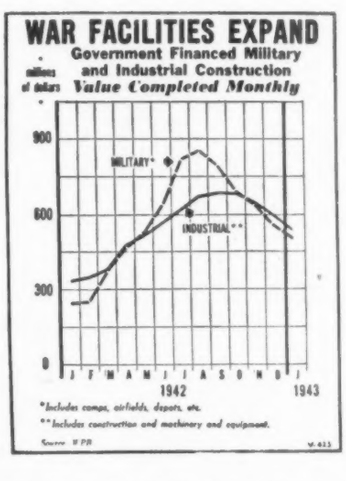
Director Joseph B. Eastman of the ODT announced in Washington recently that 100 bulk-cement cars would be converted immediately to transport at least 12,000,000 gallons of kerosene annually to the New England states. The cars after conversion will have a capacity of 8,500 gallons each. They probably will be in operation soon between Texas City, Texas, and Chelsea, Massachusetts.

CURRENT BUSINESS INDICATORS

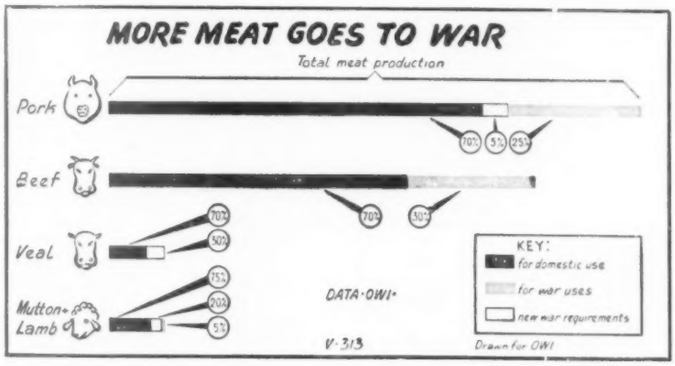
another P and Q exclusive

THE War Production Board has now officially asserted its intention to regard the nation's industrial facilities for the manufacture of urgently needed components as one great pool of productive capacity. Whenever, in order to meet the requirements of the war-production program, it will be necessary to reshuffle a manufacturer's order board, or to redistribute orders among the various manufacturers within one or more industries, or to cancel the orders of some purchasers outright, such action will be followed ruthlessly and without regard to profits, customer preferences, or post-war markets.

The General Scheduling Order issued on February 26 will serve as the foundation stone of the War Production Board in this program to establish an orderly flow of critical common components. Under this order all critical components are divided into three categories, depending upon the extent of the shortage anticipated in the supply of each. Each manufacturer of a component in the first category is required to file a regular operations report showing his plant's productive capacity, and an analysis of unfilled orders and shipments. The second group of components is designated Class X, and every manufacturer of these products must file, in addition to the regular operations



report, a detailed future delivery schedule, with which he is required to comply in making deliveries, except for such changes as may be made in the schedule by the War Production Board. Finally in Class Y are included the most critical types of the seven most critical of the common components: machine tools, three types of compressors, one type of heat exchanger, seven types of turbo blowers and exhausters, two types of industrial jewels, two types of radio test equipment, and machetes. No order for a Y item may be placed or accepted until it has been authorized by the War Production Board, and the latter may specify not only the date of delivery but the particular producer with whom the order is to be placed. Deliveries of both X and Y components are to be made in accordance with the provision of this order, regardless of any preference ratings or other directives previously issued by the War Production Board.



While some of the provisions of the new scheduling order were contained in previous W. P. B. regulations covering individual components, this constitutes the initial action in the drive to coördinate the production scheduling activities of the War Production Board in accordance with a firm set of uniform principles and procedures. Indicative of the new philosophy behind this approach are the far-reaching powers which the Director General of Operations may invoke whenever he considers such action necessary:

(1) Direct the return or cancellation of any order on the books of a manufacturer.

(2) Direct changes in the delivery or production schedule of a manufacturer.

(3) Allocate orders placed with one manufacturer to another manufacturer.

(4) Revoke any authorization to place an order granted by him pursuant to this order.

(5) Take such other action as he deems necessary, with respect to the placing of orders for, or the production or delivery of, critical common components.

In other words, critical common components are in effect now under virtually the same system of complete allocation as are the controlled raw materials. No more sweeping authority than this order will be needed to control effectively the production and distribution of critical components. The extent to which this authority will be exercised in the case of any individual component or group of components will depend principally upon the adequacy of the output to meet the ever-increasing demand of our war supply program. One of the main purposes of the new scheduling order is to provide a sound informational basis for anticipating possible shortages and for determining what rescheduling procedures are required in order to assure the requisite production. There is a growing conviction in Washington that the achievement of the 1943 munitions production objectives will depend primarily upon the availability of components, and that, in the absence of rescheduling activity by the War Production Board, serious shortages of many components will be widespread by midsummer. It may be expected, therefore, that the Director General of Operations will in the very near future take some of the drastic steps required to implement the general scheduling order.

In the meantime the volume of our munitions production continues to mount. In February the average daily rate of government war expenditures passed the quarter-billion-dollar mark for the first time, the munitions production index at the end of the month standing at five times the pre-Pearl Harbor level. In the 32-month period since the inception of the defense program in July 1940 war spending has aggregated over $80,000,000,000.

CEMENT-BIN ORDER REVOKED. — That portion of General Limitation Order L-179 (Part 3033—Portland Cement) which forbade cement manufacturers to allot specific bins or storage spaces to certain customers has been revoked. The original order was published in PIT AND QUARRY, September 1942, page 46.

CONSTRUCTION MACHINERY REFERENCE RATINGS. —The types of materials which in future construction projects may be assigned preference ratings was substantially broadened March 1 by the War Production Board. Under a new order now effective preference ratings may be assigned not only to construction material but also to tools, machinery or equipment which will be located in the project and which will be used there in the manufacturing or processing of goods or the performance of services. Ratings may also be assigned to any material which will be used in connection with the construction of the project, including hand tools, repair parts for construction machinery, forms, scaffolding, and the like. Construction machinery and fuel are not included.

The War Production Board will continue to assign preference ratings to all commodities, equipment, and accessories which will be physically incorporated into the project.

The new order, P-19-h, also restricts the builder to the use of only that critical material which is authorized by WPB. Critical material in excess of allowances may not be used, regardless of whether taken from stock, or made available by gift or loan.

This project rating order also enables an applicant to acquire all needed materials on one application. Only in the case of exceptions will the applicant have to file additional papers.

DPC CONTRACTS AND PRICE CONTROL. —Two types of construction contracts with the Defense Plant Corporation are exempted from price control, the Office of Price Administration announced March 15.

Excluded from Maximum Price Regulation No. 251, *Construction and Maintenance Services and Sales of Building and Industrial Equipment and Materials on an Installed or Erected Basis*, and from all other price regulations are Defense Plant Corporation's:

(1) Cost-plus-a-fixed-fee prime contracts, and cost-plus-a-fixed-fee subcontracts, and

(2) Contracts performed on the basis of costs only with no addition for profit.

These exemptions still leave contractors subject to all other price regulations with respect to their material purchases.

Construction contracts with the War and Navy Departments originally were excluded from the regulation which provided methods for other government agencies to apply for exemption on the basis of filing plans with OPA for the negotiation of all, or a type of, their contracts. Acceptance of the plan by OPA is followed by publication of an order in the *Federal Register*.

The Defense Plant Corporation filed its plan, describing its methods of negotiation for cost-plus-a-fixed-fee contracts and subcontracts of that type, on January 29, 1943. In order to avoid duplication of controls and to avoid delays, OPA granted the exception after ascertaining that the agency's plans indicated an effective control over prices. In the case of each excluded contract, the Defense Plant Corporation is required to certify to OPA and the contractor or subcontractor that the contract or subcontract has been negotiated in accordance with the plan filed with OPA. In this way both the OPA and the contractors will have definite notice that the exemption applies to the particular contract.

Since various costs on all construction projects are controlled by ceiling prices on materials and by procedures established for the control of wages by other agencies, OPA removed these contracts based on cost only from reporting and other requirements of the regulation to relieve contractors who have undertaken projects with the DPC without receiving profit.

All construction contracts with the Defense Plant Corporation other than the two types specified remain subject to Maximum Price Regulation No. 251.

The exemptions were contained in Order No. 1 to Maximum Price Regulation No. 251, effective March 12. The order is retroactive to October 30, 1942, the date on which the regulation became effective.

DOUBLE-TIME ORDER INTERPRETED.— Interpretive Bulletin No. 1 issued by the Secretary of Labor, February 17, the policy by which the secretary will be guided in the administration of Executive Order 9240, the so-called double-time order, has been clarified.

The administrative policies set forth in the Bulletin are effective March 1, 1943. It supersedes all previous interpretations and cancels any conflicting policy, heretofore stated.

The order applies to those "who make the materials and supplies necessary for the performance of" government war contracts and subcontracts. The order was intended to extend to enterprises engaged in "*producing, processing, mining* or *manufacturing* products used by the government in the prosecution of the war**." Whenever a member company is producing materials which will ultimately be used on any project related to the war program, compliance with the order is expected by the secretary.

Generally speaking, the administrative policies of the Wage and Hour Division are the guide in interpreting the order. Therefore, the basic rule to follow is: if a given employee is exempted from the wage-hour law, he is not covered by the order. For instance, employees in the managerial and executive category are exempted.

The order is applied to *individual plants* and not to the whole operations of a company. When the order is enforceable, clerical and maintenance employees, as well as production employees, must be taken into account. A plant may be subject to the order one week alone; the specific workweek is the criterion.

The full text of the bulletin follows:

INTERPRETATIVE BULLETIN NO. 1 OF EXECUTIVE ORDER 9240

The Secretary of Labor, pursuant to Section V, is authorized and directed to interpret the provisions of Executive Order 9240.[1] This bulletin is intended to set forth the secretary's interpretations. The order was designed (1) to facilitate round-the-clock war production, (2) to discourage absenteeism found to have resulted from the practice of paying premium rates for particular days as such, and (3) to assure, in the interest of efficiency and health, observance of the principle that workers should have at least one day of rest in each week. The interpretations embodied in this bulletin have been made after a number of months of experience under the order and are believed to be in accord with its purpose.

The opinions set forth here are effective March 1, 1943. Compliance with previous interpretations, although they may be modified herein, should be considered as compliance with Executive Order 9240 up to the effective date of this bulletin. Nothing herein shall be construed as justifying noncompliance with the interpretations of this department prior to the date hereof. Employers whose operations are subject to the terms of the order are advised to review carefully their overtime and premium pay practices and to conform with the order's various provisions as here interpreted.

II. *Coverage*

1. The order went into effect October 1, 1942. By its terms it applies to "all work relating to the prosecution of the war." This is interpreted to mean all work performed by prime contractors on government war contracts, by their subcontractors, and those who make the materials and supplies necessary for the performance of such contracts and subcontracts. The order was intended to extend to enterprises which are engaged in producing, processing, mining, or manufacturing products used by the government in the prosecution of the war or products used by a government contractor or subcontractors in the manufacture of war products.[2]

Enterprises which provide public transportation or communication facilities, storage, distribution, or warehousing facilities, are not covered by the order. Accordingly, employees of railroads, air lines, bus lines, trucking lines or other common or contract carriers, seagoing personnel, longshoremen, dock workers, and similar waterfront workers, are not within the scope of the order. Employees of telephone and telegraph companies and radio stations, engaged in the normal communication operations of such companies, as well as employees of newspapers, magazines, and other periodicals which disseminate general information to the public at large are also excluded. Employees of power-and-light, water, gas and other public-utility companies which merely furnish power and other facilities to the general public are not covered even though some of their output is supplied to war contractors. On the other hand, a power plant operated, for example, by a war manufacturer furnishing power or light, or other services to the factory would properly be regarded as a plant facility and would be subject to the order. Also firms engaged exclusively in distribution which do not process any war products would not be covered. Accordingly, employees of wholesalers, retailers, storage warehouses and brokers would be exempt if their employers are not engaged in any processing activity. Agricultural workers and employees of federal or state governments, and political subdivisions thereof, are not subject to the order.

2. The order should be applied on the basis of operations carried on in an individual plant. Therefore, if a particular plant is engaged in war work which is within the scope of coverage, the entire plant would be subject to the order, including production, clerical, and maintenance employees. In cases where an employer in a particular plant is engaged both in the production of war goods and in noncovered work the order wuold apply to the entire plant in the absence of segregation. If an employee works an entire workweek exclusively in noncovered production, and his duties do not contribute or relate to work which is subject to the order, such an employee would not be covered by the order for that week. On the other hand, if that employee works a portion of a week in the performance of any function contributing to the production of war goods, he would be subject to the order for the entire work week. The burden of establishing segregation is upon the employer.

[1][See *Overtime and Double Time*, PIT AND QUARRY, October 1942, page 35.—ED.]

[2]By order dated September 30, 1942, an exemption was granted for work on construction projects which is subject to the Wage Stabilization Agreement for the Building and Construction Trades Industry.

3. The order would apply to any employee engaged in coverage work if his compensation is customarily or by requirements of applicable statutes or agreements related to the number of hours worked in a day or the number of days worked in a week.

III. *Saturday and Sunday Work*

4. Paragraph I A of the order prohibits premium wages or extra compensation for work performed on Saturday or Sunday *as such*, that is, for work performed on either of those days without reference to the number of hours or days previously worked in the work week. Any attempt to clothe any other day in the workweek with the status of a premium day, *as such*, would be contrary to the order.

IV. *Double Time for Seventh Day*

5. Paragraph 1 A (1) of the order requires the payment of double time for work on the seventh consecutive day worked in any regularly scheduled work week. Under this requirement double time may be paid only if all seven days fall within the same workweek. Double time for work performed on the seventh day should be computed at twice the straight-time rate paid for work on that day or twice the average straight-time hourly rate for the work week, whichever is the customary method of computing overtime compensation. The employer's records should indicate which method is adopted.

V. *The Workweek*

6. A workweek consists of seven successive days (see Paragraph 8 below) starting on the same calendar day each week. This is the definition of a workweek under the Fair Labor Standards Act and is generally accepted by industry. The workweek may be established for the whole plant, for particular employees, or for any subdivision of the plant. The beginning of the workweek may be changed if not intended to evade the requirements of the order.

7. The order does not call for or require any particular work or shift schedule nor does it prescribe the days or hours on which work is to be performed. It is, of course, highly desirable that work schedules be posted in advance, thus enabling employees to know upon what days work will be required of them.

VI. *The Workday*

8. The order is to be applied on a 24-hour-day basis. A 24-hour period may be established as the workday for the plant or for particular employees or departments, provided such an arrangement is not designed to evade the purposes of the order. In the event no particular 24-hour period is established as the workday, the calendar day (*i. e.*, from midnight to midnight) shall be considered as the workday. Thus, work on an established workday regardless of the number of hours worked would, for the purpose of the order, be considered as 1 day of work.

9. Certain exceptions to this rule must be recognized. At times a shift may cut across two workdays. Only one of the two days is to be counted as a day worked, and that is the day on which the shift starts. Where an employee on particular occasions works beyond his normal shift and thereby works into the next workday, such excess hours should not be regarded as an additional day. However, if the employee continues to work into his day of rest to the extent of one-half his normal shift or is called back to work on his day of rest, that day must be counted as a day of work.

VII. *Effect of the Order on Applicable Statutes and Employment Contracts*

10. Such provisions of employment contracts as are in conflict with the order are to that extent modified thereby. Employment contracts or agreements as those terms are used in this bulletin include practices established by custom or usage.

11. Paragraph I A (2) contemplates that applicable statutes, such as the Fair Labor Standards Act and the Walsh-Healey Act, or employment agreements, which provide for overtime at time and one-half on a dairy or weekly basis or for the sixth day of work in a regularly scheduled workweek, shall not be disturbed by the provisions of the order. Therefore, in situations where applicable laws or employment agreements require time and one-half for overtime worked in excess of 8 hours per day or 40 hours per week, the order permits the payment of time and one-half for such overtime. Likewise, where an employment contract requires time and one-half compensation for the sixth day worked in a regularly scheduled workweek, the order permits such premium pay. If overtime compensation for hours in excess of 8 per day or 40 per week, or for the sixth day worked is not required by applicable statutes or employment agreements, nothing in the order requires the payment of such premium rates.

12. It is not the purpose of the order to disturb employment contracts which contain provisions for extra compensation for onerous work, night work, or emergency work (*i. e.*, work resulting from a sudden condition calling for immediate action); which extra compensation is in no way related to premium pay for work on Saturday, Sunday, or particular days *as such*. Accordingly, the order would not invalidate contracts, practices, or customs calling for more than time and one-half for hours in excess of 12 on a shift since such work is ordinarily regarded as particularly onerous.

13. Likewise the order would not invalidate contracts calling for premium pay for "call-in work," where the employee is summoned to duty outside his regular work schedule, and such premium rates are unrelated to work on Saturday, Sunday, or any other day as such.

14. Furthermore, the order does not prevent the payment of shift wage differentials or bonuses, or attendance bonuses, where such payments are not in fact related to work performed on Saturday, Sunday, or particular days, as such.

VIII. *Holidays*

15. Paragraph I B of the order has two requirements: (1) It requires time and one-half for work on the six holidays enumerated in the order, and (2) it forbids payment of any premium wage or extra compensation for work on any other holidays as such. A choice is afforded between Memorial Day and any other holiday of greater local importance. Failure to select a substitute holiday leaves Memorial Day as the sixth holiday under the order. The holiday chosen as a substitute for Memorial Day need not be the same holiday each year but only six holidays may be paid for at premium rates in the 12-month period beginning October first.

16. The order requires that time and one-half compensation be paid for work on designated holidays but forbids payment in excess of time and one-half. Thus, if the wages of an employee include compensation for a holiday although not worked, the additional amount which must be paid under the order for work performed on that holiday is limited to such amount as brings the total compensation for the day to time and one-half.

17. Compensation for work performed on a holiday should be computed at one and one-half times the straight-time rate paid for work on that day or one and one-half times the average straight-time hourly rate for the workweek, whichever is the customary method of computing overtime compensation. The employer's records should indicate which method is adopted.

18. For purposes of computing the seventh day of work in a workweek under the order, the designated holidays must be included in the count whether or not work is performed on such days. An idle holiday should be included in computing the sixth day worked in the workweek unless the employment contract specified otherwise.

19. Insofar as the order requires payment of time and one-half for work on the designated holidays, it means payment of time and one-half for the hours worked on the calendar holiday, namely, hours worked between midnight at the beginning of the holiday and midnight at the close of the holiday.

20. However, in order to give all employees equal benefit of the holiday, it is permissible to compensate employees at time and one-half for all hours worked on a shift, some part of which cuts across the calendar holiday. It is not permissible to pay the time and one-half holiday rate for more than one shift in a situation in which the employee works two shifts, both of which cuts across the calendar holiday. However, employees must be paid time and one-half for at least all the hours worked on the calendar holiday.

21. If one of the designated holidays falls on Sunday, either Sunday or Monday may be observed as the holiday, but not both.

22. There is no provision in the order relating to compensation on holidays not worked.

IX. *Offsets, Crediting, and Pyramiding*

23. The time and one-half premium pay required for work on the six holidays designated in the order may not be offset or credited against overtime or premium pay required for any other day or portion of the workweek by virtue of this order or applicable statute, such as the Fair Labor Standards Act, the Walsh-Healey Act, or the Federal Eight-Hour Law. For example, an employee works 6 days of 8 hours each or a total of 48 hours in a workweek. The second day is one of the designated holidays and the 8 hours worked on that day must be paid for at time and one-half. This premium pay may not be credited or offset against the time and one-half required by statutes for hours over 40 during that week. Both must be paid.

24. Similiarly, the double time required for the seventh consecutive day worked in the workweek may not be offset or credited against overtime or premium pay required for any other day or portion of the workweek by the order or existing law. Thus, if in the example in Paragraph 23, above, the employee works an additionalal or seventh consecutive day in the same workweek, he must receive double time for that day. This double time may not be offset or credited against the holiday premium pay in this example, nor against the time and one-half due for the hours worked in excess of 40 prior to the seventh day.

25. On the other hand, it is contrary to the purposes of the order to allow the pyramiding of overtime or premium rates on a particular day. Thus, double time and no more may be paid for work on the seventh consecutive day worked in the workweek even though, by virtue of the employment contract or applicable statute, the hours worked on that day may exceed 8 or are in excess of 40 for the workweek or otherwise call for overtime rates of pay. For example, an employee works all 7 days of the workweek, 8 hours each day. The hours worked on the seventh day call for time and one-half under the Fair Labor Standards Act and double time under the order. The two premium rates may not be pyramided—only double time may be paid for work on that day. The same is true even though the employee worked over 8 hours on the seventh day, which excess hours may also call for time and one-half.

26. Also, since the order limits premium pay for the designated holidays to time and one-half, it would be contrary to the order to pyramid the holiday rate and the weekly overtime rate required, for example, by the Fair Labor Standards Act, in cases where the holiday itself consists of hours in excess of 40 for the week. For example, the employee works 6 days of 8 hours each. The hours worked on the last day call for time and one-half under the Fair Labor Standards Act. The last day is also a holiday designated in the order. The Order limits pay on that day to time and one-half.

27. For the same reason, where the holiday coincides with the sixth day worked in the workweek, which day by contract may also call for time and one-half, the order prevents the pyramiding of the two overtime rates.

28. Likewise, not more than time and one-half may be paid for work on the sixth day worked in the workweek even though the hours worked on that day may be in excess of 8 for the day or 40 for the week.

29. Even though the hours worked on the holiday in excess of 8 require time and one-half under the Walsh-Healey Act, the order limits the amount of compensation to time and one-half and prevents the pyramiding of overtime rates or the hours worked in excess of 8.

X. *Absences*

30. Full days of absence.

(1) If an employee is absent for all of one or more days, such days are not to be included in computing the seventh day. The only two exceptions to this rule are a designated holiday on which no work is performed and the case where an employee reports with the reasonable expectation of work and is sent home because of a lack of work or other reason beyond his control. Such days should be counted in computing the seventh consecutive day.

(2) With respect to the inclusion of full days of absence for the purpose of determining whether a sixth day has been worked, the answer is to be found in the prevailing custom, practice, or agreement, in the plant. However, the counting of days of absence merely for the purpose of evading the prohibition in the order against premium pay for Saturday and Sunday work as such would be in contravention of the terms of the order.

31. Absences for parts of workdays.

(1) The order does not require that any particular number of hours be worked in a day for that day to be regarded as a day worked under the order.

(2) Where an employee is absent for part of a workday for a justifiable reason, the day must be counted as a day worked for the purpose of computing the seventh day of work in the workweek. Since one of the basic purposes of the order is to discourage absenteeism, days on which an employee does not work his full schedule but absents himself for a portion of the day without justifiable cause should not be counted in computing the seventh day. It is permissible, however, for the employer to allow the employee to make up during the subsequent days of the workweek the time lost by such voluntary absence, and to be compensated at the rate of double time on the seventh day of the workweek for hours worked on that day. However, double time may be paid on the seventh day only for those hours worked after the time lost has been made up by the employee.

(3) In computing the sixth day worked in the workweek the question as to inclusion of days on which the employee has been absent for a portion of the day may be determined by the prevailing custom, practice, or agreement in the plant, provided days are not counted merely for the purpose of evading the prohibitions against premium pay for Saturday and Sunday, as such.

XI. *Enforcement*

32. Paragraph 11 of the order directs all federal departments and agencies to conform the provisions in all existing and future contracts negotiated, executed, or supervised by them to the policies and requirements of the order. The various contracting agencies of the government will refuse to reimburse con-

tractors for payments made contrary to the provisions of the order.

XII. *Executive Order 9250*

33. Payments required or forbidden by the terms of Executive Order 9240 do not, in our opinion, require approval of the War Labor Board as wage increases or decreases under the terms of Executive Order 9250. In situations where changes in the wage structure or premium rates are permitted but not required by Executive Order 9240, the advice of the War Labor Board should be obtained before such changes are initiated by an employer.

Effective date: March 1, 1943.

LABOR-SHORTAGE AREAS.—Industrial areas in which labor shortages have become acute now number 36, four more than a month ago. [1]Three communities—Akron, Ohio; Bath, Maine, and Portsmouth, New Hampshire—however, have been shifted from the shortage list to the group of areas in which there is a present balance of labor supply and demand.

The communities added to the list of shortage areas are Portland, Maine; Evansville, Indiana; Gary-Hammond-South Chicago, Indiana and Illinois; Tampa, Florida; Savannah, Georgia; Burlington and Wilmington, North Carolina.

The WMC's legal staff said the 48-hour directive would supersede any employer-labor agreement limiting working time but would not affect wage agreements. Nor is the War Manpower Commission to consider the effect of their actions upon costs. If the adoption by a company of a 48-hour week involves increased labor costs, that factor will not be taken into consideration by WMC officials.

Other details brought out were:

(1) In the case of a busines that operates both inside and outside a critical labor-shortage area, those employees within the area will go on a 48-hour week if by so going production can be increased or additional labor made available. Those outside the area will not be affected at this time.

(2) A business like a railroad or cross-country trucking company, that operates partly inside but mostly outside an area, will not immediately be affected.

(3) The 48-hour week in lumber and the non-ferrous metals industries will exist throughout the nation, as "a logical follow up of previous actions." Other special industry arrangements will be made if and when the facts justify such action.

(4) All industries will be studied, however, and the present list may be extended or revised at any time.

The establishment of a general 48-hour week in these critical labor-shortage areas will be carried out by the area and regional directors of the War Manpower Commission. The directors will have the authority, subject to appeal, to decide disputes over extension of the 48-hour work week in their territories.

If a dispute over policy arises that involves two or three geographical areas, the matter will be settled by negotiation between the directors of those areas. If the dispute expands into a national matter, then it will be discussed in Washington.

If the workers who would be released by the company going on a 48-hour week are not needed elsewhere, the War Manpower Commission will say: "Don't go on the 48-hour week until the workers are needed."

A list of the regional offices[2] of the War Manpower Commision follows:

[1][The original list was published on page 55 of PIT AND QUARRY, March, 1943.—ED.]

WAR MANPOWER COMMISSION REGIONAL OFFICES

Region I: Joseph A. Smith, Regional Director, 10 Post Office Square, Boston, Massachusetts. (Maine, New Hampshire, Vermont, Connecticut, Rhode Island, Massachusetts.)

Region II: Mrs. Anna Rosenberg, Regional Director, 11 West 42nd Street, New York, New York. (New York State.)

Region III: L. B. F. Raycroft, Regional Director, 1634 Widener Building, Philadelphia. (Pennsylvania, Delaware, New Jersey.)

Region IV: Dillard Lasseter, Regional Director, 1025 Vermont Avenue, NW, Washington, D. C. (Maryland, Virginia, West Virginia, District of Columbia, North Carolina.)

Region V: Robert C. Goodwin, Regional Director, 521 Union Commerce Building, Cleveland. (Kentucky, Ohio, Michigan.)

Region VI: William H. Spencer, Regional Director, 222 West Adams Street, Chicago. (Indiana, Illinois, Wisconsin.)

Region VII: Bowman F. Ashe, Regional Director, 157 Peachtree Street, NW, Atlanta, Georgia. (Alabama, Florida, Georgia, Mississippi, South Carolina, Tennessee.)

Region VIII: Frank M. Rarig, Jr., Regional Director, 500 Midland Bank Building, Minneapolis. (Minnesota, Iowa, North Dakota, South Dakota, Nebraska.)

Region IX: Ed. McDonald, Regional Director, 1600 Fidelity Building, Kansas City, Missouri. (Missouri, Arkansas, Kansas, Oklahoma.)

Region X: James H. Bond, Regional Director, New Mercantile National Bank Building, Dallas, Texas. (Texas, Louisiana, New Mexico.)

Region XI: John R. McCusker, Regional Director, 221 Equitable Building, Denver, Colorado. (Montana, Wyoming, Idaho, Utah, Colorado.)

Region XII: William K. Hopkins, Regional Director, 245 Furniture Mart Building, San Francisco. (California, Arizona, Oregon, Washington, Nevada.)

MANPOWER COMMISSION URGES WORKERS REMAIN ON JOBS.—Collis Stocking, Associate Director, Bureau of Program Planning and Review, War Manpower Commission, and also Chairman of the Interdepartmental Committee on Essential Activities has urged workers in the crushed-stone, sand-and-gravel and ready-mixed concrete industries to remain on their present jobs until such time as official announcement is made of a change in the status of these industries.

On February 2 the WMC cited certain occupations as nondeferrable regardless of the industry involved. These are the jobs to which Mr. Stocking refers when he makes an exception in the closing sentence of his telegram reprinted below.

[2][See *48-Hour Workweek Ordered* in PIT AND QUARRY, March 1943, pages 55-56, for a list of the cities included in the numbered regions. —ED.]

These nondeferrable occupations apply without exception to every industry.

When the list of essential activities was released by the Selective Service System on July 14, 1942, it included the following paragraph:

Construction — Highway and street construction, marine construction; and construction of approved industrial plants, houses, hospitals, and military projects and repair of such facilities; as well as all basically metallic materials, parts, equipment; and services necessary to complete such construction.

Whenever a sand-and-gravel operation is set up within the territorial limits of a construction project, or adjacent thereto, Executive Secretary Ahearn of the National Sand & Gravel Association points out, it is included within the *Construction* category and is therefore an "essential activity." Mr. Stocking's telegram to that association, however, refers to the normal operation of a sand-and-gravel business from a permanent or semi-permanent location, the business being conducted from year to year and serving the construction market in a specific area. The same observation applies to the crushed-stone industry.

The text of the telegram follows (the message to the National Ready Mixed Concrete Association is similar):

NATIONAL CRUSHED STONE ASSOCIATION AND NATIONAL SAND AND GRAVEL ASSOCIATION:

War Manpower Commission's Committee on Essential Activities has not included the production of crushed stone, sand and gravel in its list of essential activities. However, the committee clearly has excluded the production of these items from list of nondeferrable activities and occupations recently released. Would urge that employees of your industries remain on their present jobs except those specifically listed as nondeferrable until such time as an official announcement is receivable of change in status of this activity.

COLLIS STOCKING,
Associate Director, Bureau of
Program Planning and Review,
War Manpower Commission.

MINING - MACHINERY MANUFACTURE.—The Director General for Operations, WPB issued on March 11 Limitation Order L-269 issued by the War Production Board to become effective that day and Form PD-815, which must be submitted on or before March 25, 1943, and on or before the 15th of each succeeding calendar month, by manufacturers of equipment described in List "A". On and after April 1, 1943, schedules of production and shipment of the manufacturers of mining machinery will be subject to change by the Director General for Operations. The Director General for Operations may also direct the quantity and type of repair parts to be produced or delivered by any manufacturer in any calendar month, and that he may direct changes in the production or delivery schedule of manufacturers if that is considered necessary for adequate production or delivery of repair parts.

The text of the order follows:

PART 3201—MINING EQUIPMENT
[Limitation Order L-269]

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of certain critical materials used in the production of mining equipment for defense, for private account and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense.

§3201.1 *Limitation Order L-269*—(a) *Definitions.* For the purposes of this order:

(1) "Mining equipment" means any complete equipment or apparatus of the types, descriptions, and classifications set forth on List A hereto annexed.

(2) "Repair part" means any part manufactured for use in the repair and maintenance of mining equipment.

(3) "Manufacturer" means any person who constructs or manufactures mining equipment to the extent that he is engaged in such construction or manufacture.

(b) *Production and deliveries of mining equipment.* (1) On or before March 25, 1943, and on or before the 15th of each succeeding calendar month, each manufacturer shall file in triplicate on form PD-815 a schedule of proposed production and deliveries and a report of the previous calendar month's shipments and orders.

(2) On and after April 1, 1943, each manufacturer shall produce and deliver mining equipment only in accordance with the schedule filed pursuant to paragraph (b) (1) or as the same may be changed by the Director General for Operations.

(3) With respect to mining equipment, the Director General for Operations may:

(i) Direct the return or cancellation of any order on the books of a manufacturer.

(ii) Direct changes in the production or delivery schedule of a manufacturer.

(iii) Allocate orders placed with one manufacturer to another manufacturer, or

(iv) Take such other action, as he deems necessary, with respect to the placing of orders for, or the production or delivery of, mining equipment.

(c) *Repair parts.* The Director General for Operations may direct the quantity and type of repair parts to be produced or delivered by any manufacturer in any calendar month, and he may direct changes in any manufacturer's production or delivery schedule for mining equipment so as to provide for adequate production or delivery of repair parts.

(d) *Substitution and conservation of critical materials.* In the manufacture of any item of mining equipment or repair parts, no manufacturer shall use rubber, aluminum, copper, zinc or alloy steels, except in bearings, electrical conductors, or parts subject to high stress, shock, abrasion, wear or corrosion.

(e) *Miscellaneous provisions*—(1) *Applicabil-*

ity of regulations. This order and all transactions affected thereby are subject to all applicable regulations of the War Production Board as amended from time to time.

(2) *Appeals.* Any appeal from the provisions of this order shall be made by filing a letter in triplicate, referring to the particular provision appealed from and stating fully the grounds of the appeal.

(3) *Communications to War Production Board.* All reports required to be filed hereunder, and all communications concerning this order, shall, unless otherwise directed, be addressed to War Production Board, Mining Equipment Division, Washington, D. C., Reference L-269.

(4) *Violations.* Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using, material under priority control and may be deprived of priorities assistance.

(5) *Records and reports.* All persons affected by this order shall keep and preserve for not less than two years accurate and complete records concerning the manufacture, sale and delivery of and orders for mining equipment and repair parts. All persons affected by this order shall execute and file with the Director General for Operations, War Production Board, such reports and questionnaires as said Director shall from time to time require.

Issued this 11th day of March 1943.

CURTIS E. CALDER,
Director General for Operations.

LIST A

Coal cutting machines
- Coal cuttting machines, all types
- Trucks for cutting machines, caterpillar and track-mounted

Drills
- Coal drills, electric
- Drilling machines, core drills

Mine conveyors, underground and slope
- Conveyors, belt type
- Conveyors, chain type
- Conveyors, elevating type
- Conveyors, shaking type
- Duckbill loading heads

Mine haulage
- Mine locomotives (not exceeding 20 tons)
- Mine cars
- Mine car couplers, automatic, cast steel
- Shuttle cars, self-propelled trackless

Mine hoists
- Hoists, portable mine, underground
- Hoists, stationary mine, shaft and slope

Mine loaders
- Loaders underground, mucking machines
- Loaders, underground, scraper and slusher
- Loading machines, mobile underground, other

Mining equipment, specialized
- Aerial tramways
- Coal breaking equipment, cardox and airdox
- Dumpers, mine car
- Mine doors, automatic
- Miner's lamps, wet cell
- Charging racks for wet cell lamps
- Rock dust distributing machines
- Cages
- Skips

Crushing and grinding machinery, stationary, mine and smelter types
- Crushers, gyratory or cone, except those used as a part of a portable crushing plant
- Crushers, jaw, all sizes larger than 30"x44" opening, except those smaller sizes of a type built exclusively for mining and smelting
- Crushers, vertical pick coal
- Grinding mills, ball, rod, pebble, tube
- Pulverizers, ore

Ore dressing and coal preparation machinery
- Agitators (except concrete)
- Clarifiers and thickeners
- Classifiers, hydraulic
- Classifiers, mechanical, rake, spiral
- Classifiers, pneumatic
- Concentrating tables, gravity (wet, dry)
- Conditioners, pulp
- Density controllers
- Distributors, pulp
- Driers, ore, coal, mineral
- Feeders, reagent (wet, dry)
- Filters, concentrate, gravity, pressure, vacuum
- Flotation machines, mechanical, pneumatic
- Heavy density separators (sink-float machines)
- Hydraulic separators
- Jigs, coal
- Jigs, ore
- Log washers
- Magnetic separators, ore and concentrate
- Mineral samplers, automatic, mechanical

MINING ORDER P-56 REVISED.—Preference Rating Order P-56 of the War Production Board was again amended March 17, 1943. As revised it makes important changes in the procedure to be followed in obtaining priority assistance beginning April 1, 1943. The scope of coverage of the order, as well as the basic definitions of maintenance, repair and operating supplies, remain practically unchanged.

The revised P-56 has been integrated into the Controlled Materials Plant. Filing of the PD-400-C application for the assignment of quotas by producers constitutes compliance with CMP. Producers are prohibited from qualification under CMP-5, the so-called Maintenance and Repair Order (MRO).

Existing mine serial numbers will not be revoked unless PD-400-C applications indicate that specific plants are so inactive as to warrant the withholding of quotas. WPB reserves the right to cancel mine serial numbers. Companies wishing to obtain mine serial numbers will proceed either by submitting an application to the Mining Equipment Division at Washington or by dealing with representatives of the division in the field, or by application to the appropriate State Coordinator of Mines.

A producer who needs new equipment should execute Form PD-731 and forward it to the Mining Equipment Division. For equipment covered by WPB-L-192 an effort must first be made to obtain suitable used equipment by consulting the Construction Machinery Specialist in the nearest WPB Regional Office. If suitable used equipment is not available, then the producer must execute Form PD-556 and at the same time submit Form PD-731 to the Mining Equipment Division.

If mine serial numbers for a specific plant have not been issued or have been refused, then a blanket preference rating of A-2 is assigned to deliveries of maintenance, repair and operating supplies. Plants not covered by mine serial numbers apply for new equipment according to the provisions of subparagraph (e) (2).

The full text of the order follows:

PART 982—MINES AND SMELTERS

[Preference Rating Order P-56, as Amended March 17, 1943]

MINES

Preference Rating Order P-56 (§ 982.1), as heretofore amended, is further amended to read as follows:

The fulfillment of requirements for the defense of the United States has created a shortage in the supply, for defense, for private account, and for export, of materials used in the operation of mines, and the following order is deemed necessary and appropriate in the public interest and to promote the defense of the United States:

§ 982.1 *Preference Rating Order P-56*—(a) *Definitions.* (1) "Producer" means a person operating any of the following enterprises:

(i) Any plant actually engaged in the extraction by surface, open-pit, or underground methods, or in the beneficiation, concentration, or preparation for shipment, of the products of mining activity;

(ii) Any plant wholly engaged in the processing and burning of refractories;

(iii) Any prospecting enterprise for the discovery or exploration of new or additional mining projects, including the construction of access roads.

(2) "District" means a mine supply control district of the Board of Economic Warfare.

(3) "Maintenance, repair and operating supplies" means material used for the following purposes in the conduct of any enterprise described in paragraph (a) (1):

(i) Minimum upkeep necessary to continue the working condition of essential property or equipment;

(ii) Restoration of essential property or equipment to a sound working condition after wear and tear, damage, destruction or failure of parts, or the like have made the property or equipment unfit or unsafe for service;

(iii) Where such material is essential to and consumed in such operation. The term does not include raw materials which enter into or form part of the finished product.

(4) "Priorities assistance" means any preference rating, allotment under the Controlled Materials Plan, or other form of authorization to acquire material, issued by or under authority of the War Production Board.

(b) *Purpose and scope.* The purpose of this order is to provide procedures for producers, as defined herein, to obtain maintenance, repair, and operating supplies and mining machinery and other material and equipment.

(c) *CMP Regulation No. 5 not applicable.* None of the provisions of CMP Regulation No. 5 shall apply to any producer, as defined herein, and no such producer shall obtain any material under said regulation.

(d) *Issuance of serial numbers.* Producers and districts may apply to the War Production Board for serial numbers. Such applications may be addressed to War Production Board, Washington, D. C., Reference: P56, or may (in the case of producers) be filed with the appropriate War Production Board Regional Office, Attention: Regional Technical Adviser, Mining Equipment Division, or with the appropriate State Coordinator of Mines. Serial numbers may be issued to producers and districts and may be denied or cancelled by the Director General for Operations in appropriate cases. In taking such action and in assigning priorities assistance, the Director General will consider the importance to national defense of the present and prospective output of materials to be produced, the consumption of critical material involved, the importance to national defense of competing demands for such material, and competing demands for manpower.

(e) *Priorities assistance for producers with serial numbers.* Producers holding serial numbers may apply for priorities assistance as follows:

(1) For maintenance, repair and operating supplies, by filing the appropriate form in the PD-400 series.

(2) For mining machinery and other material and equipment, by submitting to the War Production Board, a written application describing the machinery or equipment needed, the reasons why such machinery or equipment is essential for the proper operation of the producer's plant, and such other or further information as may from time to time be required, and shall also file such forms and supply such information as may be required by the provisions of any other order with respect to any particular type of equipment.

(f) *Priorities assistance for certain foreign producers.* To enable a producer not holding a serial number hereunder and located outside the United States and within the jurisdiction of a district, to obtain priorities assistance, the following procedure is established:

(1) For maintenance, repair, and operating supplies, a district may apply for priorities assistance by filing the appropriate form in the PD-400 series, and the Director General will grant such priorities assistance as he deems appropriate. A producer not holding a serial number and located in a district may apply for priorities assistance by submitting to such district his purchase orders for maintenance, repair or operating supplies, together with such information as the applicant may deem relevant in support of his application and such information as may be required by the district. Within the limits of the priorities assistance granted to it pursuant to this paragraph (f) (1), such district may authenticate any such purchase order for maintenance, repair or operating supplies by indicating the appropriate priorities assistance and countersigning the purchase order as follows:

Approved:

.....
Name of district.

.....
Signature of authorized official.

(2) For mining machinery and other material and equipment, a producer not holding a serial number and located within a district, may submit to the War Production Board a written application containing the information described in paragraph (e) (2), which must be endorsed with the signed approval of the district within which he is located.

(3) A distributor of maintenance, repair or operating supplies or of other mining machinery or equipment, located outside the United States and within the jurisdiction of a district may apply for priorities assistance in the same manner as prescribed in paragraphs (f) (1) and (f) (2) for producers not holding serial numbers and located within the jurisdiction of a district. A distributor shall not dispose of material so acquired except upon written approval of the district.

(g) *Priorities assistance in other cases.* A preference rating of A-2 is hereby assigned to deliveries of maintenance, repair, and operating supplies to all producers not holding serial numbers or otherwise specifically provided for in this order. Such producers may apply for priorities assistance for mining machinery or equipment, or for further priorities assistance for maintenance, repair, or operating supplies, by submitting to the War Production Board a written application containing the information described in paragraph (e) (2).

(h) *Restrictions on use of priorities assistance.* Notwithstanding the provisions of any other order or regulation of the War Production

Board, no producer shall acquire any mining machinery or equipment, or maintenance, repair, or operating supplies through use of a preference rating or other form of priorities assistance assigned otherwise than pursuant to this order or an order in the P-19 series.

(i) *Application and extension of priorities assistance.* Preference ratings assigned and allotments of controlled materials made pursuant to this order shall be applied, extended or made in accordance with the terms of Priorities Regulation No. 3, CMP Regulation No. 1, or other relevant War Production Board regulation. A producer in making use of any such priorities assistance, shall endorse on his contract or purchase order "P-56, Serial number ....," inserting in the blank his serial number hereunder, if any. The use of such endorsement by a producer shall constitute a representation, subject to the criminal penalties for misrepresentation contained in section 35A of the Criminal Code (18 U. S. C. 80), that the item ordered will be used for the purpose for which priorities assistance was granted to acquire it.

(j) *Restrictions on receipts and inventory.* Notwithstanding the provisions of any other order or regulation of the War Production Board, including CMP Regulation No. 2, receipts and inventories of producers shall be subject to the following restrictions only: No producer shall receive any delivery of material which will increase his inventory to an amount greater than the minimum necessary to sustain his current level of operations, and the ratio of such inventory to current production shall in no event exceed the ratio of average inventory to average production for the years 1938, 1939, and 1940.

(k) *Restrictions on use and resale of material.* No person shall use any material obtained pursuant to this order for any purpose other than that for which priorities assistance was granted to acquire it; and no person shall resell any such material except:

(1) To a producer holding a serial number hereunder, or

(2) With the approval of the Mining Equipment Division, or

(3) If he is located outside the United States and within a district, with the written approval of such district.

(l) *Records, audits, and reports.* Each producer and each distributor shall keep and preserve for a period of not less than two years accurate and complete records of all transactions affected by this order, and shall submit from time to time to audit and inspection by duly authorized representatives of the War Production Board. Each producer and each distributor shall execute and file with the War Production Board or other designated agency such reports and questionnaires as the War Production Board may from time to time require.

(m) *Appeals.* Any appeal from the provisions of this order shall be made by filing a letter in triplicate, referring to the particular provision appealed from and stating fully the grounds of the appeal.

(n) *Communications.* All reports and applications hereunder and all other communications with respect to this order shall, except as otherwise specifically provided, be addressed to War Production Board, Washington, D. C., Reference: P-56.

Issued this 17th day of March 1943.

CURTIS E. CALDER,
Director General for Operations.

TRANSPORTATION TAX IN INTRA-OPERATIONAL TRUCKING.—D. S. Bliss, Deputy Commissioner of Internal Revenue, Baltimore, has written a letter to Hayes and Hayes, tax counsel for the National Sand & Gravel Association, expressing the bureau's policy toward the application of the 3-per cent. property transportation tax to the intra-operational trucking of minerals. The bureau regards the tax as payable in two cases: Amounts paid to truckers for hauling excavated material, such as stone, sand, gravel, etc., from the point of extraction to the point of initial processing; and, with respect to the truck transportation of overburden or topsoil, if the owner of the deposit designates the place to which the overburden or topsoil is to be removed. If the trucker is free to dispose of the overburden or topsoil as he sees fit, the tax is not applicable.

Thus the industry is left with no alternative, according to Vincent P. Ahearn, executive secretary, so far as the present policy of the bureau is concerned, but to pay the tax under the facts cited. It should be emphasized that "if the relationship of employer and employee exists, for Federal employment-tax purposes," the amounts paid to the truck drivers by their employers are not subject to the tax.

The deputy commissioner's letter reads in part as follows:

You state that you have been requested by the National Sand & Gravel Association to secure an interpretation of Section 3475 of the Internal Revenue Code as it relates to the liability of that industry for the tax under the following circumstances:

"*Facts:* The facts as presented to us disclose that in the normal course of operation the owner of a gravel deposit must first remove the overburden or top soil before the sand and gravel can be removed. It is a common practice for the owner to contract with truckers for the removal of this overburden or top soil to some other part of the premises or off the premises entirely. This raises the first question upon which an interpretation is sought, to wit: Whether the removal by contract truckers of the overburden or top soil from one part of the premises to another or the removal of it entirely from the premises is deemed transportation of property and subject to the 3 per cent tax.

"Further facts disclose that the sand or gravel is then hauled to a processing plant, generally on the premises, for processing before it can be sold commercially. Here again the owner of the operation may contract with truckers to haul the sand or gravel from the point of extraction to the point of initial processing. This raises the further point for interpretation, to wit: Whether the hauling of the sand and gravel from the point of extraction to the point of initial processing by contract truckers constitutes transportation of property within the meaning of Section 3475 and hence subject to the 3 per cent tax."

The tax imposed under Section 3475 of the Code applies to any transportation of property from one point in the United States to another, including intracity, intraplant and other local movements. The term "property" means any physical matter regardless of value over which the right of ownership or control may be exercised.

If the owner of the gravel deposit does not designate the place to which the overburden or top soil is to be removed and the truckers are free to dispose of the overburden or top soil as they see fit, the amount paid for the removal of the overburden or top soil would not be subject to the tax. However, if the owner of the gravel deposit designates the place to which the overburden or top soil is to be removed, the amounts paid to the truckers for the transportation of the overburden or top soil would be subject to the tax.

Amounts paid to the truckers for hauling the sand or gravel from the point of extraction to the point of initial processing constitute amounts paid for the transportation of property from one point in the United States to another within the meaning of the statute and, therefore, such amounts are subject to the tax.

TRUCK-MIXER SIZES LIMITED.—Simplification measures imposed on the manufacture of portable construction concrete mixers, trucks mixer-agitators, and contractors' dewatering and supply pumps on February 25 by the Director General for Operations will effect an over-all 74-per cent. reduction in the number of models and sizes hitherto manufactured. These measures, it is estimated, will increase production, bring about some saving in critical materials, and liquidate approximately 4,350 tons of slow-moving inventory.

Schedules V, VI and VII of Limitation Order L-217 issued that day limit the manufacture of portable mixers, mixer-agitators and pumps to specified sizes, types, and models; simplification measures are also imposed on accessories and on the use of paint and critical metals. Repair parts of all items are exempted; and orders for contractors' dewatering and supply pumps by and for the armed forces, the War Shipping Administration, and firms designated by the Navy as procurement agents are exempted from the provisions of Schedule VII. The schedules became effective on March 15, 1943, but material in transit to a producer or in process of manufacture on that date is exempted.

The basic order L-217, issued November 17, 1942, provided for the application of simplification and conservation measures to construction machinery and equipment production through the issuance of schedules affecting specific equipment.

Truck mixer-agitators (Schedule VI) may be manufactured in only two specified models and in two sizes of each model. No metal may be used in running board platforms or drum guards except for supporting brackets. Approximately 3,000 tons of inventory will be liquidated by the provisions of Schedule VI. Orders for other sizes already in production on March 15 may be completed.

The text of Schedule VI follows:

PART 3115—CONSTRUCTION MACHINERY AND EQUIPMENT SIMPLIFICATION AND CONSERVATION

[Schedule VI to Limitation Order L-217]

TRUCK MIXER-AGITATORS

§ 3115.7 *Schedule VI to Limitation Order L-217*—(a) *Definitions.* For the purposes of this Schedule VI:

(1) "Person" means any individual, partnership, association, business trust, corporation, governmental corporation or agency, or any organized group of persons, whether incorporated or not.

(2) "Producer" means any person engaged in the manufacture of truck mixer-agitators.

(3) "Truck mixer-agitator" means any mixer body suitable for truck mounting ordinarily used for mixing or agitating concrete in transit, where the batched materials are or may be loaded by gravity into the mixer drum.

(4) "Repair part" means any part manufactured for use in the repair of truck mixer-agitators.

(b) *Limitation on production.* (1) On and after March 15, 1943, no producer shall put into process any materials for the manufacture of truck mixer-agitators which do not conform to the sizes and types established in paragraph (c) hereof. Nothing in this paragraph (b) (1) shall be deemed to prohibit the use of any such materials which may have been in transit to such producer or in process by him on that date.

(2) Nothing in this schedule shall be deemed to restrict the production of repair parts.

(c) Limitation on sizes and types.

(c) *Limitation on sizes and types.* Producers are limited to the following sizes of truck mixer-agitators, and no more than one type (either the inclined axis rotating drum or open body type) is permitted for each such size:

(1) 2 cubic yard mixer (3 cubic yard agitator).

(2) 4 cubic yard mixer (6 cubic yard agitator).

(d) *Limitation on painting.* On and after March 15, 1943, no producer shall use striping or trimming on truck mixer-agitators, nor, except for sign lettering, use more than one color finish coat paint on any one truck mixed-agitator and its repair parts if painted. Nothing in this paragraph (d) shall be deemed to require the repainting of any truck mixer-agitators or repair parts in any such producer's inventory on March 15, 1943.

(e) *Limitation on attachments.* On and after March 15, 1943, no producer shall use or put into process any metal in the manufacture of running board platforms or drum guards for truck mixed-agitator except for supporting brackets. Nothing in this paragraph (e) shall be deemed to prohibit the use of any metal which may have been in transit to such producer or in process by him on that date.

(f) *Restrictions on producers.* No person, unless actively engaged in the current production of truck mixed-agitators (as indicated by his January, 1943, filing of production and shipment schedules on Form PD-697, pursuant to Limitation Order L-192) shall thereafter enter into the production thereof.

Issued this 25th day of February 1943.

CURTIS E. CALDER,
Director General for Operations.

EDITORIAL

Absenteeism in Industry

LIKE all other problems of public interest, that of absenteeism in industry is receiving a disproportionately large amount of publicity which contributes little information as a help toward a general understanding of the question. The subject is one which lends itself readily to misrepresentation both on the part of management and on that of labor representatives. Certain sections of business management, determined on a policy of opposing labor on all grounds and at all costs and aiming its accusations particularly at that portion of labor which is organized, ventures out on unsound ground and indulges in charges that are not supported by the findings of impartial investigators. Certain representatives of organized labor, on the other hand, believing that labor can do no wrong, are equally unfair in what they allege to be the facts of the situation.

To the credit of both employers and workers it should be said that an increasingly large number of managers and of union officials are giving attention to the underlying causes of absenteeism by studying them and applying effective realistic remedies. Unfortunately the number of such cases is still not large enough and the results obtained are still not widely enough known to affect in a wholesome manner the attitude of the remainder in each group or of those sections of the public not directly involved.

An intelligent understanding of the problem is not furthered by the emotional qualities of most public discussions of the subject. Name-calling, that favorite device of all energetic propagandists, is freely indulged in, so that workers absent for good cause are carelessly lumped with those who stay away from work for whimsical or selfish reasons, and the terms, "slacker" and "*saboteur*" are loosely applied to all. Isolated instances of high absentee rates are quoted as being of national applicability, sufficient and genuine reasons for absence from work are misrepresented, and in other ways the realities are distorted to a degree that makes intelligent consideration of the problem almost impossible. In the heat of such a state of the public mind legislators rush in with hastily-conceived proposals for the correction of a situation that, while not as grave as represented, is still important enough to justify careful study. The result is a clamor for "work-or-fight" laws and similar bills which, by their very names or by those given them in the press, carry implications of a lack of patriotism that does not exist on anything like the scale that is so vividly described to us.

Ever since the introduction of the factory system absenteeism has been a factor in management's troubles. Psychologically considered, it represents to a large degree man's natural reaction to the rigorous system imposed by modern factory conditions. Man, like other animals, does no more than is actually needed to meet the requirements of day-to-day existence except that, under the influence of social and economic rivalry, he has been spurred on to exert himself more than such a simple and instinctive law demands. And, even where that rivalry has accomplished the social end of making men seek to acquire more than they can effectively use, there is a subconscious conflict between the simple and instinctive urge and the artificially-stimulated desire to follow a culture pattern of behavior.

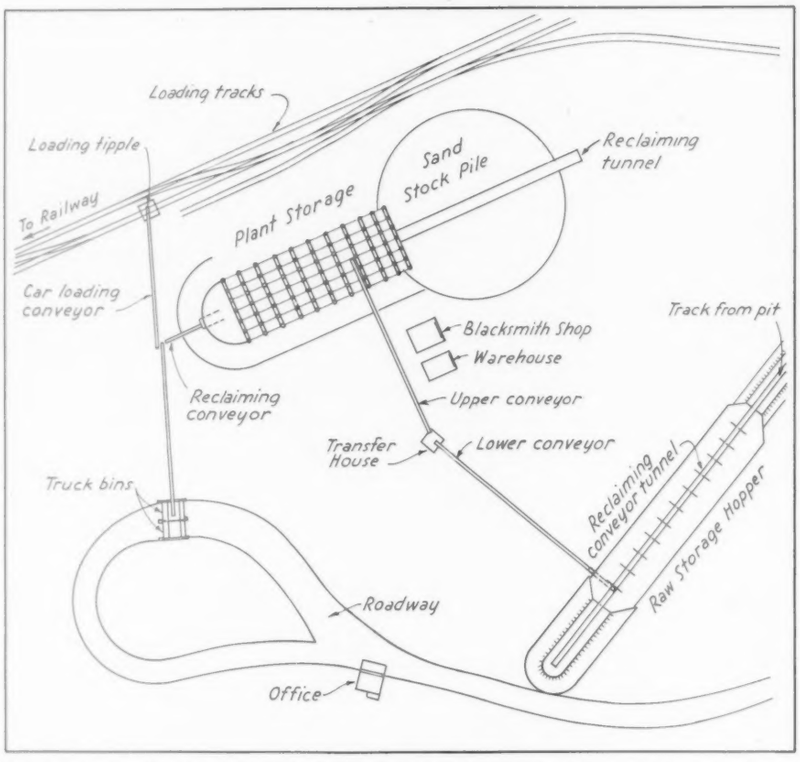
Intelligent management recognizes the existence of this conflict and tries to soften its friction by granting vacations with pay, by shortening or redistributing the scheduled hours of work, by providing employee housing facilities nearer the point of employment or by providing better transportation between the workers' homes and their work, by bettering the physical working conditions in the plant, particularly in such matters as noise and ventilation and periods of relaxation. It is giving practical effect, too, to the latest and most realistic theories of physiological and psychic fatigue by employing physicians and psychiatrists to investigate the genuineness of employees' reasons for being absent. With the increased employment of women the psychic factors take on a new and greater importance.

The absenteeism facing the country to-day is no different, either in its underlying causes or in its extent, from that with which managers in days gone by have had to deal. Twenty years ago it was found that the average absence from factory work in the United States and England ranged from 6 to 10½ days a year or from 2 to 3½ per cent. of the scheduled working time for so-called "unavoidable" causes—sickness and industrial and non-industrial accidents. "Avoidable" absence was found to be even more variable. In England during the last war the total absences (avoidable and unavoidable) varied from 5.3 to 14.3 per cent. in the case of men and from 7.6 to 12.3 per cent. in the case of women. In the United States during that war absenteeism reached 11, 13 and even 18 per cent. in shipyards and in southern cotton mills, according to studies made by various government agencies.

THE United States Department of Labor recently listed a number of means for reducing absenteeism; these included workers' health programs with periodical check-ups and the adoption of preventive measures; reduction of health hazards caused by exposure and sudden temperature changes; watching the health of the children in the workers' homes and providing day nurseries, particularly since so many mothers are employed; providing better housing and transportation facilities; arranging reasonable hours of work and periodic days of rest; and accident-prevention campaigns. Such means have resulted in a reduction of absenteeism to 2 per cent. in one aircraft plant. The appointment of joint labor-management committees is an effective beginning in the fight against needless absence from work.

The intelligent approach is through planned removal of the underlying causes and not through legislation. Management and labor, if allowed to approach the problem realistically by concerted action, can through coöperative effort find the remedy.

NEW GRAVEL PLANT'S OUTPUT



General layout of plant and yard of the American Aggregates Corporation's new plant at Green Oak, Michigan.

another ON THE SPOT report

THE American Aggregates Corporation in February, 1942, put in operation at Green Oak, near Brighton, Michigan, a new sand-and-gravel plant which is probably the outstanding one of that year and probably of several years to come. According to L. B. Clark, superintendent, this is the best plant the company has ever built, and the writer, who has seen nearly every plant the company has built or rebuilt in the past 14 years, is inclined to agree with him.

Like all the company's latest plants, it has sufficient raw- and finished-material storage capacity to make the pit, plant and loading operations independent of each other. The use of a reclaiming tunnel for finished materials makes it possible to load out almost any desired blend from storage. The plant has processed an average of 600 tons of material per hour over extended periods and it is believed to be capable of handling 1,000 tons per hour under ideal conditions. Its production in 1942 exceeded 1,000,000 tons.

The company's operations at this location began in 1917 when the Detroit-Greenville Gravel Corporation, which in 1929 was merged with other companies to form the American Aggregates Corporation, built a plant there. A shovel did all the loading in the pit until 1926, when it was supplemented by a dredge. A separate plant was built in 1927 to process the material from the

By W. E. TRAUFFER

dredge and this was used until it burned down in 1929. During the time in which both plants were in operation up to 2,000,000 tons was produced in a year and it was not unusual for 200 cars to be loaded in 24 hours of operation. The main plant handled only the dry material loaded by the shovel until 1929 when a desanding station was built to remove some of the excess sand from the dredged material before it was fed to the main plant. In 1932 shovel loading was discontinued and from then on any necessary desanding was done at the dredge. A small plant was built to process sand reclaimed from the lake as needed. This arrangement was operated until January, 1942, shortly before the new plant went into operation. These plants are now being dismantled and their equip-

A view of the plant showing the trestle, the truck-loading building, and the plant and boom conveyors.

AVERAGES 600 TONS HOURLY

Another plant view with car-loading conveyor at left and truck-loading bin and conveyor at right.

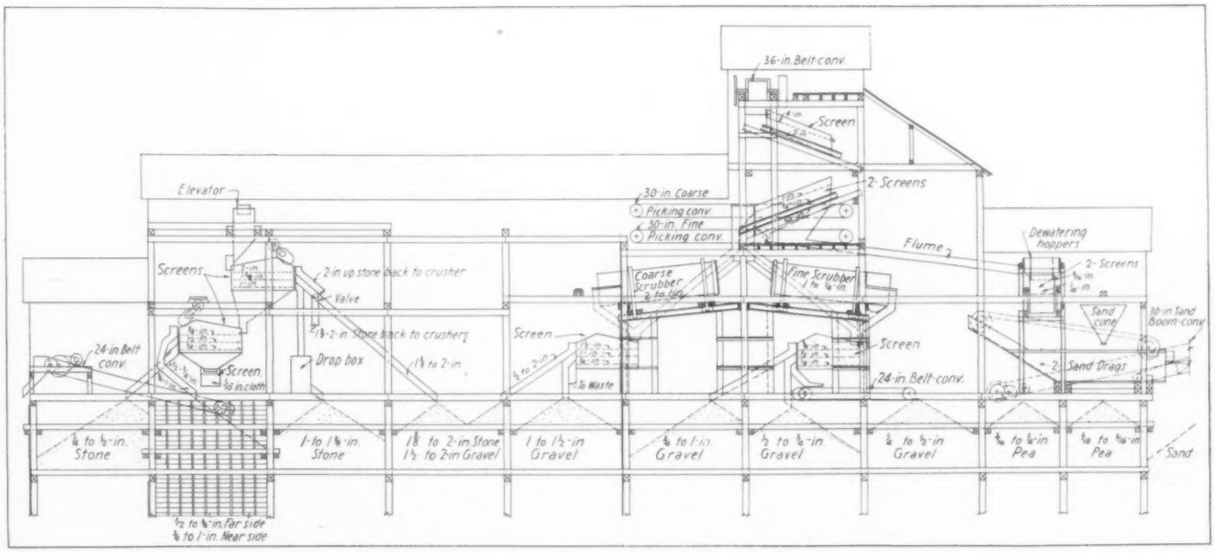
ment used in other operations. The American Aggregates Corporation's central office is at Greenville, Ohio. F. D. Coppock is president and M. G. Kerr of Detroit is Michigan District Manager.

The new plant was designed by the corporation's engineering staff under the direct supervision of J. C. Patty, chief engineer, and was built by its forces. It incorporates many features which have become standard in the corporation's plants and a few which are new.

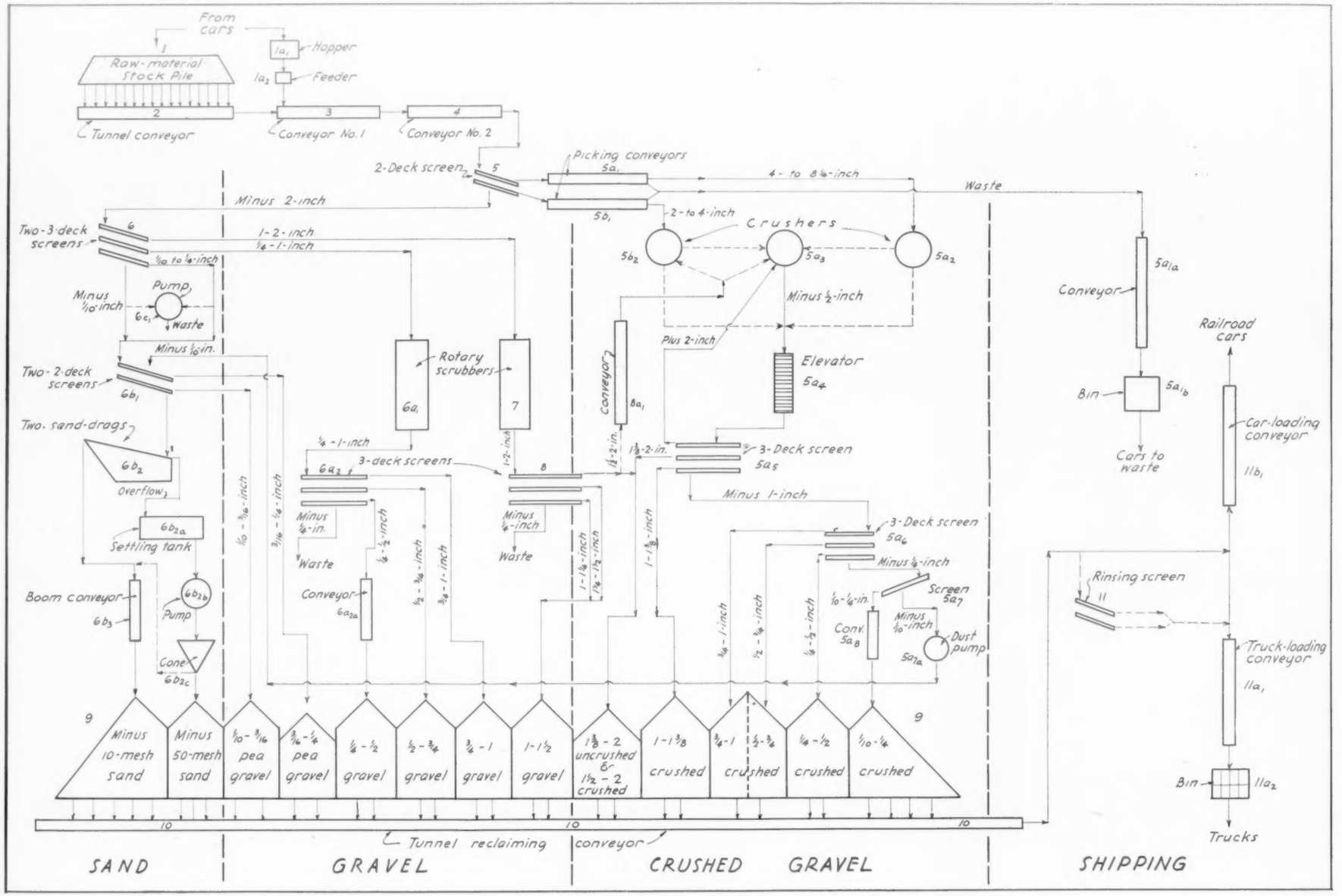
Instead of the usual timber framework steel bents and trusses on concrete footings support the two main conveyors and the truck-loading conveyor. The main plant building has sheet-metal siding over a wooden framework and is supported on the 11 partitions which separate the ground-storage compartments over the reinforced-concrete reclaiming tunnel. Above this tunnel, and poured as part of it, are 11 concrete bulkheads, roughly triangular in shape, which extend upward and outward from the top corners of the tunnel. The angle of the bottoms of these triangles is approximately the angle of repose of the material. These bulkheads are supported at their ends on concrete pillars and the wooden partitions extend upward from them.

Some years ago the most important product of these operations was railroad ballast but concrete aggregates, especially for the Detroit market, gradually superseded it. In 1940 the demand for war projects became important and it is estimated that over 75 per cent. of the output is now going to them. In 1941 material was shipped 90 miles to Camp Custer and to other projects, including the huge Ford Williow Run Bomber Plant near Ann Arbor which is still being supplied. Other projects supplied included an airport at Osceola, north of Bay City, the Dow magnesium plant at Ludington, the Ford airplane-parts plant at River Rouge, the Buick Aluminum Foundry, the Chrysler Corporation, an Army Air Base at Oscoda, etc. The plant has been operated two 8-hour shifts daily since May and present commitments will keep it busy into the second half of 1943.

The company owns about 900 acres of land of which about 500 acres consists of sand-and-gravel deposits. About 150 acres has already



Cross-sectional elevation of the screening, washing and storage departments.



Flow-sheet of operations at Green Oak, Michigan, plant of the American Aggregates Corporation.

FLOW SHEET TABULAR ANALYSIS OF THE OPERATIONS AND EQUIPMENT OF THE AMERICAN AGGREGATES CORPORATION'S SAND AND GRAVEL PLANT, GREEN OAK, MICHIGAN—PART I.

(Key numbers refer to corresponding numbers on accompanying flow sheet)

Operation	Key	Equipment	Brand Name	Model Number, Size, Capacity or Type	Power Source	Power Transmission
Raw-Material Storage and Reclamation		(From cars)				
	1	Stock pile		Ground-level, 6,000-cu. yd.		
	2	Conveyor (To 3)	Rex Stearns	Belt, 36-in. by 200-ft.	40-h.p. G.E.	Texrope V-belt and gears
		(From cars)				
	$1a_1$	Hopper				
	$1a_2$	Feeder (To 3)	Jeffrey-Traylor	Electric, vibrating, 42- by 72-in.		
Scalping		(From 2 and $1a_2$)				
	3	Conveyor No. 1	Rex Stearns	Belt, 36-in. by 250-ft.	100-hp. G.E.	Texrope V-belt and gears
	4	Conveyor No. 2	Rex Stearns	Belt, 36-in. by 220-ft.	100-hp. G.E.	Texrope V-belt and gears
	5	Screen (Oversize to $5a_1$, second size to $5b_1$, fines to 6)	Simplicity	Vibrating, scalping, 5- by 10-ft., 2-deck	15-hp. G.E.	Texrope V-belt
Gravel Screening and Scrubbing		(From 5)				
	6	Screens (2) (Oversize to 7, second size to $6a_1$, 2 fine sizes to $6b_1$ or $6c_1$)	Simplicity	Vibrating, 5- by 12-ft. 3-deck	15-hp. G.E.—10-hp. Allis-Chalmers	Texrope V-belt
		(From 6)				
	7	Scrubber	Greenville Mfg. Works Allswede	Rotary, 60-in. by 20-ft.	100-hp. G.E.	Texrope V-belt and gears
	8	Screen (2 coarse sizes to 9 or $8a_1$, third size to 9, fines to $6c_1$)	Allis-Chalmers	Vibrating, 5- by 10-ft., 3 deck	15-hp. Allis-Chalmers	Texrope V-belt
		(From 8)				
	$8a_1$	Conveyor (To $5b_2$ or $5a_3$)	Rex Stearns	Belt, 24-in. by 50-ft.	10-hp. G.E.	Texrope V-belt and gears
		(From 6)				
	$6a_1$	Scrubber	Greenville Mfg. Works Allswede	Rotary, 60-in. by 20-ft.	100-hp. G.E.	Texrope V-belt and gears
	$6a_2$	Screen (2 coarse sizes to 9, third size to $6a_{2a}$, fines to $6c_1$)	Allis-Chalmers	Vibrating, 5- by 10-ft., 3-deck	15-hp. Allis-Chalmers	Texrope V-belt
		(From $6a_2$)				
	$6a_{2a}$	Conveyor (To 9)	Rex Stearns	Belt, 24-in. by 50-ft.	10-hp. G.E.	Texrope V-belt and gears
		(From 6 and 5a7a)				
	$6b_1$	Screens (2) (2 coarse sizes to 9, fines to $6b_2$)	Simplicity	Vibrating, 4- by 8-ft., 2 deck	$2\frac{1}{2}$-hp. G.E. (2)	Texrope V-belt
Sand Classification		(From $6b_1$)				
	$6b_2$	Drag tanks (2) (Product to $6b_3$, overflow to $6b_{2a}$)	Greenville Mfg. Works	7-ft. by 30-ft.	$7\frac{1}{2}$-hp. G.E.	Texrope V-belt and gears
		(From $6b_2$ and $6b_{2c}$)				
	$6b_3$	Conveyor (To 9)	Rex Stearns	Boom belt, 30-in. by 125-ft.	25-hp. G.E.	Texrope V-belt and gears
		(From $6b_2$)				
	$6b_{2a}$	Tank		Settling, 20- by 10-ft. by 7-ft. deep		
	$6b_{2b}$	Pump	Amsco Nagle	Centrifugal sand, 2-in.	$7\frac{1}{2}$-hp. G.E.	Direct-connected
	$6b_{2c}$	Cone (Product to 9 or $6b_3$)		Settling, 6-ft. diameter		
Gravel Crushing		(From 5)				
	$5a_1$	Conveyor (Gravel to $5a_2$, waste to $5a_{1a}$)	Rex Stearns	Picking belt, 30-in. by 50-ft.	10-hp. G.E.	Texrope V-belt and gears
	$5a_2$	From $5a_1$) Crusher (To $5a_3$ or $5a_4$)	Allis-Chalmers	Gyratory, Number $7\frac{1}{2}$ K	75-hp. Western Electric	Texrope V-belt
		(From 5)				
	$5b_1$	Conveyor (Gravel $5b_2$, waste to $5a_{1a}$)	Rex Stearns	Picking belt, 30-in. by 50-ft.	10-hp. G.E.	Texrope V-belt and gears
	$5b_2$	(From $5b_1$ and $8a_1$) Crusher To $5a_3$ rr $5a_4$)	Symons	Disc, 48-in.	150-hp. Westinghouse	Flat belt
	$5a_3$	(From $5a_2$,5 b_2; $8a_1$and $5a_5$) Crusher (To $5a_4$)	Symons	Short-head cone, 4-ft.	150-hp. G.E.	Texrope V-belt

(Continued on page 48).

FLOW SHEET TABULAR ANALYSIS OF THE OPERATIONS AND EQUIPMENT OF THE AMERICAN AGGREGATES CORPORATION'S SAND AND GRAVEL PLANT, GREEN OAK, MICHIGAN—PART II.

(Key numbers refer to corresponding numbers on accompanying flow sheet)

Operation	Key	Equipment	Brand Name	Model Number, Size, Capacity or Type	Power Source	Power Transmission
Crushed-Gravel Sizing	$5a_4$	(From $5a_2$, $5a_3$, and $5b_2$) Elevator	Greenville Mfg. Works	18-in. pitch Super Capacity bucket elevator	30-hp. G.E.	Texrope V-belt and gears
	$5a_5$	Screen (Oversize to $5a_2$, second and third sizes to 9, fines to $5a_6$)	Allis-Chalmers	Vibrating, 5- by 10-ft., 3-deck	15-hp. Allis-Chalmers	Texrope V-belt
	$5a_6$	(From $5a_5$) Screen (3 coarse sizes to 9, fines to $5a_7$)	Allis-Chalmers	Vibrating, 5- by 10-ft., 3-deck	15-hp. Allis-Chalmers	Texrope V-belt
	$5a_7$	(From $5a_6$) Screen (Oversize to $5a_8$, fines to $5a_{7A}$)	Simplicity	Vibrating, 3- by 6-ft., 1-deck	5-hp. G.E.	Texrope V-belt
	$5a_8$	(From $5a_7$) Conveyor (To 9)	Rex Stearns	Belt, 24-in. by 30-ft.	7½-hp. G.E.	Texrope V-belt and gears
	$5a_{7A}$	(From $5a_7$) Pump (To $6b_1$)	Amsco Nagle	Centrifugal sand, 3-in.	7½-hp. Master	Direct-connected
Storage and Reclamation	9	(From 8, 6_2, $6a_{A2A}$, $6b_1$, $6b_2$, $6b_{2C}$, $5a_3$, $5a_6$, and $5a_{7A}$) Storage		Ground level, 12-compartment, 24,000-cu. yd. capacity		
	10	Conveyor (To 11, $11a_1$ or $11b_1$)	Rex Stearns	Belt, 30-in. by 460-ft.	55-hp. G.E.	Texrope V-belt and gears
Re-rinsing	11	(From 10) Screen (Products to $11a_1$ and $11b_1$, fines to waste)	Simplicity	Vibrating, 5- by 10-ft. 2-deck	10-hp. G.E.	Texrope V-belt
Truck Loading	$11a_1$	(From 10 or 11) Conveyor	Rex Stearns	Belt, 30-in. by 195-ft.	40-hp. G.E.	Texrope V-belt and gears
	$11a_2$	Bin (To trucks)		Steel, 8-compartment, 1,500 ton		
Car Loading	$11b_1$	(From 10 or 11) Conveyor (To cars)	Rex Stearns	Belt, 30-in. by 140-ft.	30-hp. G.E.	Texrope V-belt and gears
Waste	$5a_{1A}$	(From $5a_1$ and $5b_1$) Conveyor	Rex Stearns	Belt, 24-in. by 15-ft.	5-hp. G.E.	Texrope V-belt and gears
	$5a_{1B}$	Bin (To cars to waste)				
	$6c_1$	(From 6, $6a_2$ and 8) Pump (To waste pile)	Amsco Nagle	Centrifugal sand, 3-in.	7½-hp. Master	Direct-connected

been worked out. The deposit contains some hard chert, shale, and soft stone, but the use of scrubbers in the plant prevents this material from exceeding 1 per cent. of the finished product, although the various specifications allow 2 to 3 per cent. The deposit varies considerably in gradation but averages about 50 per cent. sand.

The overburden averages 3 feet in thickness and this was overcast during the winter of 1941-42 by the drag-line now being used for loading. The deposit averages 50 feet of material above the water level and the drag-line has been digging this to within a few feet of the water. After the present workings have been expanded sufficiently the drag-line will work from this lower level and dig to a depth of 35 to 40 feet below the water level. The possibility of using the dredge later has also been considered.

● This deposit has been the scene of large-scale sand-and-gravel production since 1917 and has been a major source of supply for Detroit and the surrounding territory. In this article is described a large and modern new plant which was completed just in time to play an important part in the construction of vital war plants and projects in this area.

The Bucyrus Size 24 drag-line was converted from steam to electric operation in 1940. It has a 100-foot boom and a 5-cubic yard Page bucket and is driven by three motors — a 300-horsepower Allis-Chalmers, a 135-horsepower G.E. and a 10-horsepower G.E. The large motor is connected to the main hoist by Gates V-belts which absorb the shocks created in digging. This machine loads the material into a 180-ton steel pit hopper which has an 8¼-inch sloping-rail grizzly to remove the few large bowlders encountered in the deposit. An apron on the high side of the hopper protects the car-loader below. This hopper is similar in design to those used in other American Aggregates plants. When it is moved, at intervals of a few days, it is raised on a special car equipped with a hydraulic jack for each corner of the hopper and deposited in its new location.

The material is loaded from the hopper through three air-operated sliding gates into three 60-ton hopper-bottom steel cars. Air for these gates is supplied by a portable compressor. These cars are hauled to

the plant on a downgrade of 1½ per cent. by a Diesel-electric locomotive similar to those used in other company plants. This locomotive was formerly an electric-railway freight car and is driven by its original four motors, which receive their power from two Cummins 250-horsepower Diesel engines, each of which is connected to a 300-kv.-a generator. The track to the plant is now about 2,400 feet long and runs under a county road, known as Kensington Road, through a concrete highway overpass. This bridge was built to insure a clear right-of-way for the train and considerable fill had to be placed to relocate a short section of the county highway.

At the plant the train runs on a steel trestle from which the aggregates can be discharged on a 6,000-cubic yard raw stock pile over a 220-foot concrete reclaiming tunnel or into a hopper at the end of the tunnel. Usually the contents of the end car are discharged into the hopper, while the material from the others goes on the stock pile. When the plant is not operating, all the material goes on the stock pile, and when there is a delay at the pit, the plant is supplied entirely from the stock pile. The tunnel has 24 gates, through which the material is fed to the 36-inch by 200-foot reclaiming belt-conveyor which in turn supplies the Number 1 conveyor running to the plant. A Jeffrey-Traylor 42- by 72-inch vibrating feeder discharges the material from the hopper on this Number 1 conveyor.

Diesel-electric locomotive with cars at track hopper being loaded by the 4-cubic yard drag-line.

This 36-inch by 250-foot conveyor discharges on the 36-inch by 220-foot Number 2 belt-conveyor running to the top of the screening building, where the material is discharged on the 5- by 10-foot Simplicity 2-deck scalping screen.

Locomotive and cars passing under highway on their way to the plant.

The 4- to 8¼-inch oversize from this screen is carried on a 30-inch by 50-foot horizontal picking belt-conveyor to a chute feeding an Allis-Chalmers 7½ K gyratory crusher. The material picked out consists mainly of chert too hard for the scrubbers to break down.

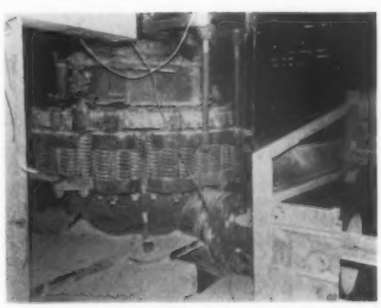
The 2- to 4-inch gravel passing over the bottom deck of the scalping screen is carried on another 30-inch by 50-foot horizontal picking belt-conveyor to a chute feeding a 48-inch Symons disc crusher. The products of either or both these crushers can be discharged for further reduction direct to an elevator or into a 4-foot Symons short-head cone crusher which is usually set at ½-inch opening. The chert, soft stone, etc., picked out of the gravel on the two picking conveyors is dropped on a 24-inch belt-conveyor which discharges it into a waste bin.

The minus-2-inch material falling through the bottom deck of the scalping screen is spread on two 5- by 12-foot Simplicity 3-deck screens. These have 1-, ¼-, and $\frac{1}{10}$-inch wire screen cloths on their top, center and bottom decks, respectively. The 1- to 2-inch gravel usually goes to a 60-inch by 20-foot Greenville Allswede rotary scrubber and the ¼- to 1-inch gravel to a 60-inch by 20-foot Allswede scrubber but butterfly gates make it possible to by-pass the scrubbers direct to the screens following them.

The product of the coarse scrubber goes to a 5- by 10-foot Allis-Chalmers 3-deck Low Head screen. This makes 1- to 1¼-inch, 1¼- to 1½-inch and 1½- to 2-inch sizes of gravel on its decks. The latter size is discharged into one storage compartment and the two smaller sizes go to another compartment over the plant reclaiming tunnel. If desired, any excess of the two coarser sizes can be diverted on a 24-inch by 50-foot belt-conveyor to the crushers. The incidental material passing through this screen goes to a waste flume.

The product of the second scrubber goes to another 5- by 10-foot Allis-Chalmers 3-deck Low Head screen. This makes ¼- to ½-inch, ½- to ¾-inch, and ¾- to 1-inch sizes of gravel over its decks and these are discharged into separate storage compartments, the first-mentioned size by a 24-inch by 50-foot horizontal belt-conveyor. The incidental material falling through the bottom deck of this screen is also discharged into the waste flume.

The $\frac{1}{10}$- to ¼-inch pea gravel or "birdseye" passing over, and the minus $\frac{1}{10}$-inch sand passing through, the bottom decks of the two screens ahead of the scrubbers are flumed to a pair of 4- by 8-foot Simplicity 2-deck sand screens. Any part of either of or both these materials can also be diverted to a tank feeding a 3-inch Amsco Nagle sand pump which pumps them, with the incidental material from the two screens following the scrubbers, to a waste pile across the loading tracks from the plant. These screens make $\frac{1}{10}$- to $\frac{3}{16}$-inch and $\frac{3}{16}$- to ¼-inch sizes of pea gravel which also go to storage compartments. The minus-$\frac{1}{10}$-inch sand falling through the bottom decks of these screens is never wasted as there is a shortage of it in the deposit. This material is flumed to a pair of 7- by 30-foot Greenville sand drags. A 30-inch by 125-foot boom belt-conveyor dis-



Short-head cone reduction crusher.

One of the two scrubbers which break down clay, shale and soft stone.

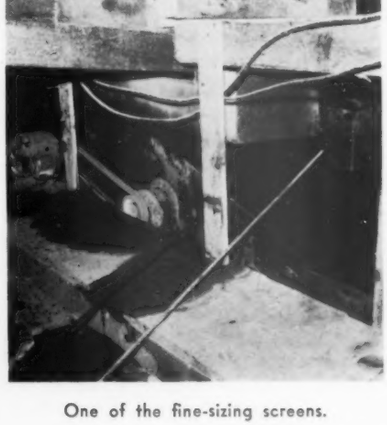
charges this product to the far end of the sand-storage pile. The steel boom is permanently suspended from the building by cables.

The overflow from the two sand drags goes to a 20- by 10-foot by 7-foot-deep settling tank. A 2-inch Amsco Nagle sand pump feeds the material settled out to a 6-foot-diameter sand-settling cone which makes a minus-50-mesh sand. This sand can be discharged on the above boom conveyor with the minus 1-$\frac{1}{10}$-inch sand or it can be discharged on the near end of the sand-storage pile.

The crushed gravel from any or all of the three crushers is fed by an 18-inch pitch Greenville bucket elevator to a 5- by 10-foot Allis-Chalmers 3-deck Low Head screen. This screen makes 1- to 1⅜-inch and 1⅜- to 2-inch sizes of crushed gravel over its second and third decks and discharges these to storage, the former through a drop box and the latter through an inclined chute. The plus-2-inch crushed gravel coming off the top deck is always returned to the Symons cone crusher, and the 1⅜- to 2-inch stone can be returned if desired.

The minus-1-inch crushed gravel falling through the bottom deck of this screen goes to another 5- by 10-foot Allis-Chalmers 3-deck Low Head screen. This makes ¼- to ½-inch crushed gravel which is chuted to one storage compartment and ½- to ¾-inch, and ¾- to 1-inch sizes of crushed gravel which are discharged to opposite sides of another storage compartment. The minus-¼-inch material falling through the bottom deck of this screen goes to a 3- by 6-foot Simplicity single-deck screen with $\frac{1}{10}$-inch wire cloth. The $\frac{1}{10}$- to ¼-inch material from this screen goes to a 24-inch belt-conveyor which discharges it at the end storage compartment. The minus-$\frac{1}{10}$-inch dust falling through this screen goes to a sump from which a 3-inch Amsco Nagle centrifugal sand pump feeds it to the Simplicity sand screens which have already been described and where it is mixed with the natural sand.

Vibrating screen sizing gravel from one of the two scrubbers.



One of the fine-sizing screens.

The storage compartments under the plant have a capacity of 12,000 cubic yards of gravel and 12,000 cubic yards of sand. Of this material about 30 per cent. is live storage reclaimable through a concrete tunnel having 26 openings under the 11 gravel compartments and two openings under the sand-storage pile. All except two of these openings are equipped with gates which are calibrated so that any desired blend can be obtained. The other two openings are in a steel double hopper which is so located that the two grades of sand stored can be reclaimed and blended through special vibrating feeder gates. The various sizes and types of material can be loaded out separately or in any desired blend on the 30-inch by 460-foot tunnel belt-conveyor, which is inclined at the end of the tunnel to discharge the material on a 5- by 10-foot Simplicity 2-deck rinsing screen. This has ⅝- by 1½-inch slotted wire cloth on the top deck and $\frac{3}{16}$-inch cloth on the bottom deck. A butterfly gate controls the discharge from the screen to the conveyors to either the car-loading or truck-loading building. When sand, concrete mix, or other products containing sand are loaded the rinsing screen is by-passed. Any material passing through the bottom deck of this screen is flumed to waste.

The 5- by 10-foot scalping screen. Motor and drive at left.

A 30-inch by 195-foot belt-conveyor carries the material to the truck-loading building which has two 4-compartment steel bins with a total capacity of 1,500 tons. A turnhead controls the discharge into the chutes to these bins. The truck shipments are weighed out on a 50-ton Howe scale and Weightograph at the plant office building. The scale has a 24-foot concrete platform.

The 30-inch by 140-foot car-load-

ing belt-conveyor discharges through a chute direct to the cars on two loading tracks. With this arrangement a 60-ton car can be loaded with sand every 3 minutes or at the rate of 1,200 tons per hour. The gravel-loading capacity is about 900 tons per hour. Car shipments are now weighed on a track scale maintained at this plant by the Pere Marquette Railway, whose tracks are connected to the plant by a 2,500-foot siding. A Merrick Type E Weightometer is now being installed on the car-loading conveyor.

Truck and trailer-load of gravel being weighed at scale-house.

This installation will save the time of the railroad company in the handling of cars over the car-loading scale. The three gravity tracks for "empties" will hold 25 cars each and the two tracks for loaded cars will hold 30 cars each. An American 48-ton steam locomotive is used for switching and spotting these cars. One of the empty tracks will be extended to connect with an old track which runs north along Kensington Road, and will then be used for hauling waste material away to a dump.

The greater portion of the heavy equipment in this plant was furnished by the Greenville Manufacturing Works. All the vibrating screens used in this plant were furnished by the Allis-Chalmers Manufacturing Company and the Simplicity Engineering Company. Chain Belt Rex Stearns conveyor idlers and pulleys are used throughout the operations. Almost all the equipment

Centrifugal pump which handles birds-eye gravel from one of the screens.

Truck scale and weight recorder in the plant office.

is driven through Gates Vulco Rope V-belts, one exception being the Symons disc crusher which is driven through flat belts.

The Shell Dieseline fuel oil used in the locomotive is unloaded from tank cars by gravity into a 20-000-gallon storage tank from which it is discharged by gravity into the locomotive. Standard Oil lubricants are used in most of the equipment.

The power used in these operations is purchased from the Detroit Edison Company at 23,000 volts. This is reduced at an outdoor transformer to 4,600 volts for the drag-line and 440 volts for the plant motors. At the drag-line the current is also reduced to 440 volts for the motors. All the motors are controlled from local switches and from central stations. A rotary converter provides d.-c. power for the vibrating feeder under the track hopper. Other electrical equipment includes a Hobart 40-volt, 200-ampere Simplified arc welder. The plant and yard are floodlighted for night operation.

The blacksmith shop at the old plant is now being used but will be replaced with a smaller one at the new plant as there is now less heavy equipment to be repaired.

The company has always tried to build up a stock pile from which deliveries can be made during the winter shutdown period. Because of the heavy demand this year, the stock pile is smaller than usual and is so located that material from any part of it can be loaded by a crane into cars or trucks in one handling. Most of this work is done by a Northwest 1-cubic yard gasoline crane. A Northwest 2-cubic yard crane, which is also used for this work, was used in the construction of the plant. At that time a 90-foot boom was used in place of the usual 75-foot boom. An Orton & Steinbrenner 1½-cubic yard steam locomotive crane is now employed in dismantling the old plant, from which some of the equipment has been shipped to a new plant the company is completing at Richmond, Indiana. A 30-ton steam locomotive is kept in reserve for use in spotting cars for stock piling, etc.

An old Sanderson Cyclone well-drill is used for prospecting the property where the ground water is close to the surface. On higher ground test shafts are dug. This drilling machine was also used to provide the drinking-water wells for the new plant. The wash water for the plant is supplied from an old dredge pond by two 8-inch Allis-Chalmers centrifugal pumps which are driven by 125-horsepower G.E. motors.

Both L. B. Clark, superintendent, and P. M. Kingsley, office manager, have been with the company for many years. Mr. Clark joined the organization in 1921 as office manager at the original Green Oak plant. In 1923 he became assistant plant manager. Later in 1925 he was made superintendent of the Richmond, Indiana, plant. After four years there and two at the Massillon, Ohio, plant in the same capacity he came back to the Green Oak operations in 1932 as superintendent. Mr. Kingsley has been with the company since 1919 and came to this location in 1931.

Determining Sizes of Mineral Particles

Simple methods for determining the size of mineral particles to be tested in the laboratory are explained in a recently-published Bureau of Mines circular prepared especially for persons with little or no previous experience in mineral "sizing," Dr. R. R. Sayers, director of the Bureau, has announced.

The paper deals primarily with the "how" of sizing to assist the many new laboratory workers who are on the job as the result of the wartime impetus given to mineral dressing and chemical engineering. The publication covers the units and properties of size, the application of sizing, the methods, and the interpretation of results. References are attached for further study if desired.

A copy of the Information Circular No. 7224, *Directions for Laboratory Mineral Sizing,* by John Dasher, assistant chemical engineer, may be obtained without cost from the Bureau of Mines, Department of the Interior, Washington, D. C.

That Junk Heap Can Furnish Material to Keep Your Equipment in Operation

another P and Q exclusive

By LAMAR JOHNSON
Formerly Vice-President and Superintendent, Dixie Sand & Gravel Corporation

A GOOD superintendent can save as much money on maintenance and repair costs and plant shutdowns as you can make buying and selling in the office. This applies especially to the small and medium-sized plant. The tools his repairmen will especially need are an oxy-acetylene welding and cutting outfit, an electric welding outfit and a junk pile. The tools the superintendent will need are a little technical knowledge, a lot of horse sense and the courage to try something new. I don't mean that he should promiscuously experiment. Experimentation and the deliberate trial of a well-thought-out idea are two different things. Of course he will have failures, but for every failure he will have a success that more than balances it. The failures do not have to be tried more than once; the successes can be used time and time again.

In such times as these, with priorities, scarcity of materials and the uncertainty of transportation, such an outlook on the problem of maintenance and repair will pay good dividends. At some time the simplest maintenance job becomes an emergency repair. It is with this thought in mind that this article is written. Most plants are a long chain of operations and the failure of any link in the chain may cause partial or total curtailment of production. The cost of this stoppage of production usually is many times the cost of the repair. This is particularly true of the smaller plant, and often a little ingenuity plus a good junk pile will get the plant turning over again before the office can get the repair parts moving from the dealer or factory. Large plants generally have a better stock of repair parts and a more flexible operation to take the shock of a breakdown. However, there are times when the emergency repair angles apply to all. Then all plants have the maintenance problem—always.

Excavating Equipment. — Many producers using drag-lines in their excavating operation know that the bucket, shackles, chain and cable cause more minor delays than any other part of this operation. In our case the digging was not especially tough but the material was very abrasive—quartz gravel and sand, containing a good bit of garnet. The problems discussed in this article have this type of material in mind. Some of the remedies would probably not apply in a rock quarry.

Most operators are familiar with the general repairs that can be made to a bucket, so we will not dwell long on that part of the job. Here your junk pile will furnish the scrap plate and angle you need. Not the same kind of wear-resistant steel, you say? So, what! Make it thicker to make up the difference, if you want; you'll never notice the difference in weight. After all such a repair is a spare-time or week-end job and several rebuildings will not cost as much as one new bucket. A bucket is never worn out as long as the yoke is solid and there is enough of the frame hanging on to it to see what the original looked like.

Shackles, however, are a different matter. Some shackles are made very hard to give wear. They usually break before they wear out. When a shackle wears out, you can see the repair job coming; when it suddenly breaks, it is always in the middle of a heavy run when you can not afford the delay. We made all our shackles from old pieces of heavy shafting and the rear axle of a truck. By the way, we usually kept the local junk dealer stripped of his supply of these axles. At 10 cents each they were worth many times their cost for use in pins and bolts, as well as for shackles.

We used a $3\frac{7}{16}$-inch shaft, cutting it into lengths about $1\frac{3}{4}$ inches long on a power hack saw. A hole, the size of the pin to be used, was bored through the center of each section of shafting. The U part of the shackle was made from a section of the axle, which was cut to the length desired. This piece of axle was heated in a blacksmith's forge just hot enough to be bent into the desired shape. We built a mandrel, which was attached to the anvil, on which to bend these. In this manner each could be bent to the same shape and size. After bending the U was allowed to cool slowly at air temperature. When the bent piece had cooled, it was beveled on all sides of each end of the U. Each end of the U was then electrically welded to the circumference side of a piece of the shaft with a low-carbon, general utility, flux-coated rod. Then another length of the same axle, with a hole through each end, made a good pin. Making these shackles is a spare-time job for your machine-shop man. He can cut and bore the shaft while he is waiting on his lathe to make a cut. (See Figure 1 for details of the shackle.)

Don't throw away those old worn-out crusher bowls and mantles. They make good cast-manganese steel wedges for the rebuilding of dipper and shovel teeth. You can take an oxy-acetylene torch and cut out more good wedges in an hour than you can buy with a $10 bill. And the best part of it is that you can

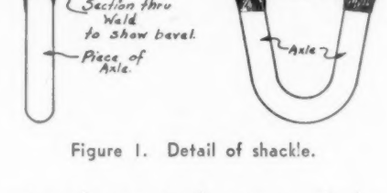


Figure 1. Detail of shackle.

cut each one to fit any particular tooth and thereby save a lot of time and welding rod. As far as I have been able to observe, they are just as long-wearing as the bought ones. The method used to attach these is the same that would be used with the ones that you would buy. By the way, these old bowls make good chute hoppers at the head ends of conveyors—a little heavy, perhaps, but you seldom have to lift them but once.

However, we found a method of tooth rebuilding that suited our type of digging better. As stated before, our type of material was abrasive but not tough to dig. The type of tooth that we used was hollow in the center, fitting over a stub tooth solidly attached to the bucket. A small bolt passed laterally through both the tooth and the stub held the tooth in place. We found that using

the wedge method of rebuilding did not give enough protection to the side of the tooth. The tooth would wear thin on the sides and would either break or get loose on the stub. I am not discussing rebuilding the tooth once or twice, but many times. (As I recall, we used five sets of teeth on three drag-lines in three years; that gives you some idea.)

To get back to the tooth rebuilding, we found that we got what we wanted by placing a piece of truck spring leaf on the top and on the bottom of the tooth and filling in the opening between the leaves with welded metal (see Figure 2). The spring leaf was wide enough to project over the edge of the tooth from ¼ to ½ inch and this projection gave the necessary protection to the side of the tooth. It also made a nice shoulder at which point the spring leaf was welded to the tooth, and, later, a point from which to cut the remaining part of the spring leaf when it was time to be rebuilt again. All the edges of the spring leaf were welded with a low-carbon, flux-coated rod. The filling in can be done just about as you like it. We used manganese rod for this for a while, but later went to the general-utility rod. We could not see much difference in our case and the general-utility rod was easier to work. I know it would seem as if the spring leaves would wear at the end and then split off, but over a period of years I have seen only one tooth do this. We have even bought spring leaves from the junk man for this job.

Chain and cable delays are best anticipated by keeping a good supply of each on hand and seeing that you always have one cut to just the right length ready to go. Seeing that the sheaves are large enough and kept running freely is only good cable practice. However, the drums are one place where the plant operator can greatly reduce cable wear. Many drag drums wear bell- or egg-shaped, which causes the cable to lap over and not spool evenly.

To replace the drum, or take it down and machine it true again, is quite a job. It can be corrected in about two hours by two half-cylinders of cold-rolled plate rolled to your careful measurements. Bevel all the edges for V-butt welds and weld over the original drum spool. Weld the seams to each other and the ends, along the circumference, to the drum. Electric-weld them with low-carbon steel rod. On most machines there is a shoulder, where the factory drum lagging rests, on which this cylinder can rest. The factory lagging is out of the question as it cuts down too much power on the drag drum, as a rule. The added difference to the new circumference of the spool will not be noticed.

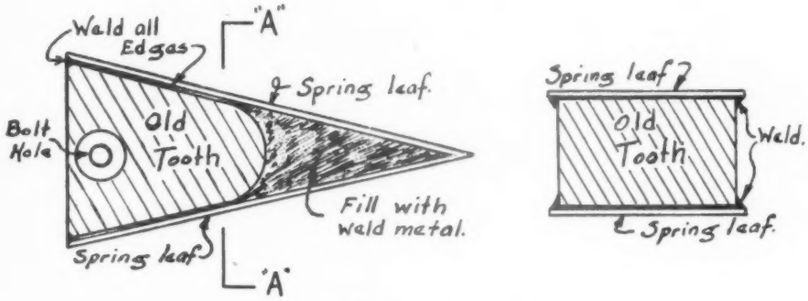


Figure 2. Detail of dipper tooth.

Transportation Equipment. — Most operations, using trucks in the hauling of both raw and finished materials, never think of welding a spring leaf. Don't let them tell you it can't be done. Under certain conditions it can and is well worth while. This applies especially to the main leaf, when it breaks through the bolt hole in the center or at the end close to the shackle bushing. When the break is near the shackle bushing it is merely a matter of proper welding to make the repair. The break should be beveled for a V-butt weld. The bevel should be made from the top side of the leaf and the welding done from that side. Use a low-carbon, flux-coated rod, using a medium-length arc. The welding should be done in one continuous operation as rapidly as possible, and the welded job cooled in the air in a still, warm place. After it has completely cooled remove the slag and dress on emery wheel as desired.

When the break occurs through the bolt hole in the middle of the leaf, a simple weld will not hold. A simple weld is made first, in the same manner as the weld of the break near the end of the leaf, but the leaf must be reinforced to obtain satisfactory results. Such reinforcement could obviously be made only to the main leaf of a spring. But, after all, this is the one that breaks most often and is the most expensive to replace. After the simple weld is completed, and the weld cooled, remove the slag and grind down the excess weld metal to the original surface of spring leaf.

Next prepare the patch to reinforce the break. An old broken spring leaf, the same width and thickness of the leaf to be reinforced, should be utilized for this patch. Cut a section from this old leaf the length of the U-bolt saddle block that clamps on the top of the spring. With the oxy-acetylene torch cut four holes in the patch, not too close to the edge. They should be about four leaf thicknesses in diameter. Place the patch on the welded leaf and weld it in place at the point of each hole, practically filling the hole with welding metal. Don't weld the patch at any other point.

The leaf is now ready to be used. It will be noted that you have increased the total thickness of the spring by the thickness of the patch and your U-bolts will have to be long enough to accommodate this extra thickness. We used the old heavy trucks which had 4-inch wide spring leaves on the rear. These were the ones that gave the most trouble as we usually carried 10 or 12 tons on a 5-ton capacity truck. It was bad practice then, but who to-day doesn't overload? And the welded main leaves worked well here. The weld can be made for about one-fifth the cost of a new leaf.

The fan-belt problem can often prove a serious one. It seems that there are never enough belts in stock, and a broken fan belt, with no replacement immediately available, means a piece of equipment out of use. If you can run right into town and get another, the emergency rope fan belt will not interest you, but if replacement is slow, that piece of equipment can be kept going until you can do better. Of course, as in the case of trucks, spare units should be available to replace the unit with the broken fan belt; but when you get in a jam, that is when the spares are down also. Many a plant has been shut down for much less than a fan belt.

If it is a long fan belt, a piece of rope will make a temporary replacement. Cut the proper length of *dry* rope and splice it so that you have to force it on the pulleys. You are ready to go. But after you run it a while it will become loose and will slip. Pour a little water on it and keep going and it will tighten up. This sounds like a silly repair but I have seen it keep many a piece of equipment going. This is for emergency only and should be repaired with the regular replacement when you get around to it. If rubber and fan belts keep getting scarcer, we may have to use such belts often.

Our old trucks, and there are still a number of them in the gravel industry, contained a lot of aluminum. The welding of aluminum can make a very successful repair. We regularly repaired cracked blocks, transmission housings and forks and collars of aluminum with the electric aluminum weld. The technique will be a little difficult for your welder to acquire, but he can make a success of it with a little practice and the rigid following of the rod-maker's recommendations—provided, of course, that you can buy the rod just now.

One of the most irritating sources of delay can be the magneto of your electrical equipment. There is only one answer for this problem; keep several spares and have them all as near the same size and type as possible. And don't keep all the spares adjusted for rotation in the same direction, unless you have that kind of equipment, which you probably do not. I think that I have seen more time lost changing the direction of rotation on spare magnetoes than almost any little thing that I can recall.

I wish that I knew an answer to your tire problems, but that is strictly between you and Mr. Jeffers. Experience has taught me that two things are the most essential to the life of tires in a gravel-plant operation: proper pressure in the tires and well maintained intra-plant roads. Proper air pressure does not necessarily mean that pressure which is stamped into the side of the tire. Remember, you are probably carrying twice the load for which the tire was intended and there is no need to tell you to stop it. Consult your tire-factory representative and insist on his factory making a complete study of your case and giving you *definite* recommendations. Then see that they are followed by your drivers. Well-maintained plant roads will do more toward decreasing your tire troubles than any one thing you can do. Build the best road you know how, from available materials, and see that it is maintained religiously. Money spent on this will come back many times in increased plant output.

Many plants use regular railroad gondolas and hoppers in intra-plant operations, either in hauling the raw materials to the plant or in stock-piling the finished products. Continuous loading, usually beyond capacity, and unloading causes the sides of the car to "belly" outward. These sides can be satisfactorily reinforced and stiffened by bolting an old worn-out section of rail to the top of the car's side. An 80-pound rail will just about fit most cars. The rail should be laid flat, not upright, on the top edge of the car side and bolted to the car through the web of the rail. The ball of the rail should be on the inside of the car (Figure 3). Should the rail not be long enough to cover the entire length of the car, it should be lengthened by splicing a short section of rail to each end. As the splice will be the weakest point, it should not come near the middle of the rail.

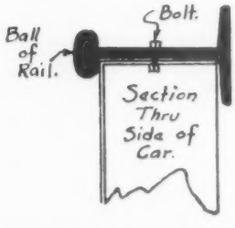


Figure 3. Rail reinforcement of car side.

Scraping the bottom of a gondola with a rehandling bucket will sooner or later damage the bottom plates of the gondola. These may be welded and patched, of course, but the best way to repair them is to put in an oak floor over the original metal one. It is surprising how long an oak floor will last here. Oak boards, at least 2 by 10's, should be laid lengthwise on the car, first laying short boards transversely for nailing strips. The boards should be nailed about every 2 feet with heavy nails. The floor should be laid closely. There is no need to bolt it to the bottom of the gondola; it is not going anywhere. With this oak bottom you will have fewer splinters in your stock pile than you had pieces of plate before and it will be a lot easier on your clam-shell bucket.

Locomotive cranes are used by many plants in the stock-piling and loading of materials. Most such crane frames are riveted and generally work loose in places, especially above the trucks near the center pins. When this happens, a good repair is made by removing the trucks and welding all the rivets and plate edges solidly and rigidly. Additional pieces of plate, used as reinforcing, can often be used to advantage. This can be done without removing the ballast, which sometimes is concrete, from between the beams of the frame.

Bucket lips on the rehandling bucket need occasional repair to keep them from leaking. A few beads with the electric welder can often correct this when the leak is at the corners, which is the point of greatest wear. The time comes, however, when it is necessary to rebuild the whole lip. Replacements are often hard to get for the exact size and type bucket you may have. In that case a satisfactory new lip can be made from a long strip of cold-rolled steel. It will not give the wear of the original lip, but it will wear in proportion to the cost. Forget the rivets, if the original had rivets in it, and weld the entire lip at every point possible, heating and bending it to shape as you weld. In fact, entire buckets can be rebuilt economically by use of the electric welder, including the rebuilding of the bushings and pins.

One of the most satisfactory emergency repair jobs we ever made on a locomotive crane was the repair to a broken drum shaft. This was hollow having a hole machined longitudinally a good distance from each end. The pins that operated the internal frictions worked in these holes. These shafts, in this particular machine, often broke near the inner end of the hollow section. We had a run of bad luck and broke two of these shafts in less than two weeks. We needed the crane badly at that time and a new shaft was at least three days away. We had the crane back in operation the next morning by taking the unbroken halves of two broken shafts and welding them together at the solid section near the middle. Careful measurement and welding were necessary, of course. After the two halves were welded together the shaft was placed in a lathe and straightened by the use of as little heat as possible and a bar. After straightening, the weld was machined and smoothed and the shaft was ready to go. Surprisingly enough that shaft lasted

for over a year, at which time we discontinued the use of that machine.

Plant Equipment.—With the war taking all the rubber and manganese, such things as chute linings and log-washer paddles may get scarce soon. We used to have our own made locally. The chute lining and log-washer paddles were made of approximately the same metal. This casting was very hard and had a sharp ring but would break if it got an overload, which is what you want in the case of a log-washer paddle. I don't know exactly what made up the material for this casting but your local foundry can work with you on this and probably develop something similar. I know we furnished the cast iron and he furnished the other ingredients, which I know included a good portion of old plow points. Anyway, that was his business. I know that he kept us supplied with paddles and chute linings that were hard to beat. The cost in the case of paddles was about one-fourth the cost of manganese ones. There was only about half as much wear in them but they had the advantage of breaking when something went wrong, which a manganese one will not always do. It may pay you to work with your local foundry if these supplies become scarcer. We saved all our old brass and cuttings and had them recast into bushings and bearings. He charged us for the labor and credited us with the material. This proves to be quite a saving over a period of time.

A big saving in maintenance costs can be made by using old dredge pipe for flumes. This is especially true where the flume is used to take the overflow from a sand-tank or log-washer. The water in both usually contains solids that soon wear the bottom out of the wood or metal-lined flume. We found that we could install the dredge-pipe flume for about the same cost as the metal-lined flume and that it would outwear several 20-gage linings of the metal-lined wood flume. And it makes a neater looking job and stays free from leakage.

To make the flume we split a section of 20-inch dredge pipe lengthwise into two half cylinders. You will find in most cases that this pipe is worn thin on only two sides. This is due to the fact that the lugs, on the opposite sides of the pipe, are usually kept in a horizontal position while in use by the dredge. This is for convenience of handling and fastening. The middle point between the lugs will be almost of the original thickness. Therefore, cut the pipe in the thin places and you have a flume that is thin at the edges but thick on the bottom where the wear comes. Cut the pipe off at the flange back of the spigot end of the pipe and weld the sections of the flume together at these flanges. We used to weld them in sections of three joint lengths each on the ground and then weld the three-joint sections together in place. To stiffen the pipe, to prevent buckling should the flume become filled with sand or water, we placed straps at about 4-foot intervals. The straps were placed across the top, the ends were turned down and welded. The straps we used were braces from the cross arms of telegraph poles, with which the local junk dealer supplied us. This braced and welded 48-foot section of flume easily withstood placing with a crane while supported only at the middle point. In place it was supported at 15-foot intervals. Once in place, with the sections welded together and given a coat of paint on the outside, we had a flume that was pleasing to the eye and efficient in every way.

I think that it is good practice to weld all pipe lines at all points possible. It not only saves in the cost of fittings but the maintenance is much less. You will have fewer leaks and fewer split joints when you go down to the plant some cold morning after the lines have been incompletely drained. This suggestion of welding works especially well on larger pipe. Even make your bends in the line with a weld; two welded 45's will not give you any more friction than a cast-iron ell.

Rebuilding conveyor pulleys and idlers is an old story with many plant operators. The objection is that they probably take a little more power to start. But the plant owner to-day is likely to have power long after he can't buy idlers and pulleys. We rebuilt conveyor idlers by placing a sleeve, made from a short section of pipe, over the original roller. This was aligned and spotted in place using oxy-acetylene and a bronze weld.

One day we needed a head pulley for a new conveyor we were erecting. We selected four pressed-steel pulleys and placed them on a suitable shaft and lined them up. A piece of $\frac{5}{16}$-inch cold-rolled sheet was rolled to the diameter of the pulleys. This was placed over the pulleys and welded securely. We then had a pulley that served as well as a cast-iron one, and one that was not likely to break through the spokes.

A good many plants still use the old conical sand-settling tank. We did, and one can make good sand with it, too. A good feature of this type of sand equipment is its low operation and maintenance cost. Its one maintenance "headache" is the valve at the discharge point. We, like most producers, originally used a type of gate valve here. This was always leaking and every so often we had to put in a new one. One day I happened to think of the old syrup-barrel valve, the kind they used to keep in country stores. I had an idea that, if we were to reverse this valve, we would have a sand-tank valve that would open easily and be almost wear-proof. Cutting a quarter section from an old 6-inch-face pressed-steel pulley, we had most of what we needed for the job. We laid over the face of this section a curved piece of ¼-inch sheet and welded it into place

(Continued on page 57)

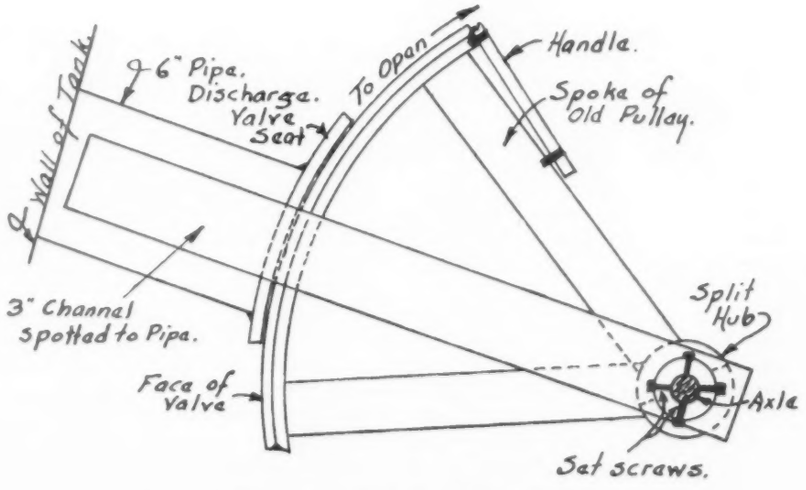


Figure 4. Detail of sand-tank valve.

Barney-Car System Helps Trucks Up Incline from Quarry Floor

A view of the incline showing barney cars and ascending and descending trucks. Rollers are spaced at regular intervals to carry the cable.

Close-up view of two passing trucks with barney car in contact with rear axle of ascending vehicle, the other being pushed down by the bumper of the descending truck.

WHILE we, the New York Trap Rock Corporation, were opening up a new 80-foot level at our Haverstraw, New York, quarry, we were confronted with an 11-per cent. incline problem.

At first we were using Grico twin-engine trucks and Easton TR-10 trailers on an 11-per cent. grade. We used this equipment for one year, but found it too expensive in gasoline consumption and tire wear. The work was especially hard on the transmissions of the trucks, and we were able to carry only a 6½-cubic yard or 8-ton pay load.

During the fall and winter months I built a model to help the trucks up the incline with a much larger pay load without any added power, since it was almost impossible to buy anything under the present priority set-up with the exception of barney-car wheels and cable.

After going through the 10-cent stores for the material needed for my model, I purchased two small toy trucks and two small toy cannons, mounted on wheels that I used for barney cars, and small awning sheaves on which I used a silk fishing line for cable. I then used a ¾-inch by 6-foot board for my 11-per cent. incline and bent it on both ends so that, after the board was placed on a few props, it had the same grade as we were confronted with in the quarry.

I figured that, without any lost friction from the cable running over the sheaves, the empty truck going down hill would balance the one coming up, so that the one coming up would only have its pay load to haul and the truck going down, with some added power, would help the load coming up, thereby increasing the amount of pay load.

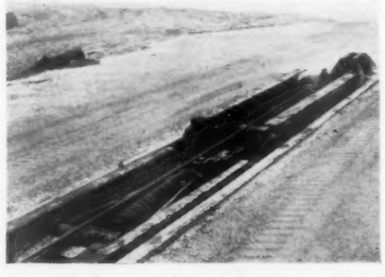
After my model was completed and working to my satisfaction Stirling Tomkins, president of the New York Trap Rock Corporation, gave me the "go ahead" sign to try it out on the Haverstraw incline. So last spring I started to install it in that quarry on a large scale.

Barney car leaving empty truck at bottom and entering pit, allowing truck to drive on.

It has now been operating more than eight months and is doing everything that I ever figurerd we could do with it and a lot more.

The whole arrangement is shown clearly by the pictures accompanying this article. I am again using the barney-car system for the hooking on and the unhooking from the loads and empty trucks without the stopping of either vehicle. The barney car runs on a 24-inch gage track which the trucks straddle. On the front of each truck is a heavy bumper that catches the front of the barney car on its way down, while the other barney car comes from a pit that the loaded truck and trailer straddle, catching on the back axle of the trailer. This is all done while the trucks are in motion.

The light truck then uses some



Braking equipment at top of the incline.

By JOE Q. TAYLOR
General Superintendent, New York Trap Rock Corporation

of its power pushing down on its barney car, which in turn transmits that power to the back of the loaded trailer on the way up. In this way the empty one on the way down does not have to use its brakes, so

General Superintendent Taylor posed before one of the trucks ready to start down the incline.

we save on brake and tire wear caused by excessive braking. When the empty truck reaches the bottom of the incline, the loaded truck is at the top and just pulls away from its barney car. The one that was being pushed down the incline by the empty truck just runs off into a pit, allowing the truck to pass over as everything is in the clear. While this barney car is running on down into the pit on an incline that is much steeper than the main incline, the top barney car runs on the level at the top. Of course, this action would bring the latter car up pretty fast after the loaded truck had pulled away. One of the pictures shows a close-up view of the braking equipment that I put on the top to stop this car very suddenly. I first used the squeezed type rail with springs for stopping the barney car, but found this was not enough, so underneath I put a bar and bumper with large coil spring so that when the car comes into the squeezed rails the front of the barney car catches this bumper and the coil springs take the last shock from the sudden stop just before the car reaches the vertical sheave which carries the cable to the underground passage. The ¾-inch 6×29 cable is carried from one track to the other by two large vertical sheaves and two half vertical and half horizontal sheaves that are under heavy plates which the truck passes over, and runs from one of these sheaves to the other through a small tunnel under ground.

The incline is 747 feet long from back of the pits on the lower level to the top level, and we are making the distance in 48 seconds. This gives us plenty of time to get a truck up every minute when the time requires us to do so, but if faster time is required we can do that also as with the Grico we have made trips in 40 seconds. We are making the grade with standard Chevrolet tractors with Eaton rear ends, and are hauling 15-ton pay loads, so we have just about doubled our pay load and have cut down on everything else in general.

We are always confronted with the possibility of the cable breaking, but as we have brakes on the trailer we have no trouble in holding the load at any place on the incline. To prevent the barney cars from being wrecked in case they should run away whenever the cable might break, I have installed in each of the pits at the bottom of the incline a cable trough pit with some slack on one end so that, when the car runs into a pit, it catches on this cable, which provides a spring action and takes the shock from the barney car and will not let it hit the back of the pit.

I use an "electric eye" for starting. As a loaded truck passes over the bottom to begin its climb it passes the "electric eye" which gives the empty truck at the top of the incline the "go" signal. When the driver starts, the loaded truck is over far enough to allow the barney car to come up behind the trailer. The empty truck at the top of the incline controls the timing.

If there is no empty truck at the top to come down there is no need of another loaded truck to come up because something must be wrong at the crusher, and, of course, if there is no load at the bottom to come up, something must be wrong with the shovel. There is no occasion for an extra empty truck to be at the shovel.

We are running four trucks to one shovel on this incline and find that it works out very satisfactorily. We always have one truck at the shovel to be loaded, one with its load on the incline, one empty on the incline, and one loaded at the crusher to be dumped in time to take its turn on the down run.

Reclaimed Junk (from page 55)

at all the edges. Another curved section of sheet, rolled to fit the first one, was welded to the end of the 6-inch pipe from which the sand was discharged. This was the seat of the valve. Two short lengths of 3-inch channel, welded to the sides of the pipe and projecting beyond the seat, made a support for the valve. Oversize holes cut in the outer ends of the channel formed a temporary bearing for the short piece of shaft that was to be the axle on which the valve worked. The valve was set approximately in place and the split hub tightened upon it. Four opposing set screws were then fastened to the channel, at each end of the shaft, to provide both vertical and lateral adjustment. The set screws were then adjusted until the face of the valve fitted against the seat at all points. A handle was attached to the valve and it was ready for trial. It worked well and has outlasted three sections of discharge pipe.

It is the little things around a gravel plant that often cause the most worry. The big breakdowns come at times, but there is not much you can do except repair them as soon as you can in the regular manner. And there is not usually much precaution you can take against the breaking of a big shaft or the cracking of a crusher frame. These things just sometimes happen and all you can do to guard against them is to see that everything is well lubricated and properly operated. But in the solving of an emergency repair or the simplifying of a maintenance problem, you can get a lot of satisfaction.

Seek Rare Minerals in Oregon Beach Sands

Continuing its program to find new domestic sources of strategic minerals needed for armaments, munitions and other war materials, Bureau of Mines engineers and chemists have completed successful laboratory investigations to recover chromite, zircon, and garnet from beach sands found along the southwestern coast of Oregon, according to Dr. R. R. Sayers, director of the Bureau of Mines.

Chromite concentrates of more than 40 per cent. chromic oxide can be produced from the heavy black Oregon sands through a series of complex milling processes. Additional treatment will yield zircon and garnet concentrates of probable commercial value.

LEFT—Truck in position to dump a load into the plant hopper. Another truck is being loaded beneath the bins.

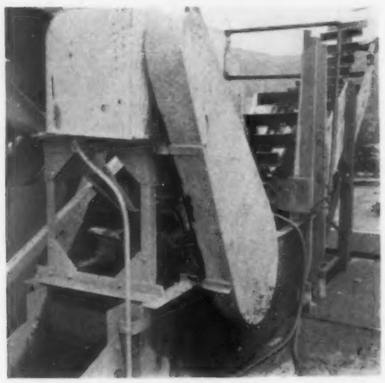
Erects Efficient 50-Ton Plant to Process Gravel on Own Farm

LIKE many other farmers, E. F. Lippert had on his farm four miles west of Alleghany, New York, a sand-and-gravel deposit of commercial quality. Unlike most of the others Mr. Lippert decided to do something about it so, with a cousin, C. M. Lippert, he formed E. F. Lippert & Company to build and operate a plant. As neither had any previous experience with sand-and-gravel production Ralph Hunt of the Screen Equipment Company was induced to design the plant for them. The result was a 50-ton per hour plant of concrete and bolted-steel construction which will bear comparison with any other plant of its size. On May 1, 1942 C. M. Lippert sold his interest in the business to G. D. Pixley and Florin Bump.

When this plant went into production in September, 1940 material was supplied to it by a 6-inch hydraulic dredge, but it soon became apparent that insufficient water was available for the development of a suitable dredge pond. Some trouble with large gravel was also experienced. As a result this method was abandoned in favor of shovel loading.

The gravel deposit covers an area of about 40 acres. On the surface is a 1-foot layer of rich, black topsoil which is sold for use on lawns. Under this is an average of 3 feet of dirt and gravel which is sold for fill and for unsurfaced roads. These materials are loaded into trucks for delivery by a ½-cubic yard Byers gasoline shovel.

The actual depth of the sand-and-gravel deposit is known to exceed 75 feet and from 15 to 18 feet of it is above ground-water level. Near the surface the gravel content is about 60 per cent. but under water the percentage of fines increases. A ⅝-cubic yard Bay City gasoline shovel loads this material into a 4-cubic yard Diamond T truck which hauls it a few hundred feet to the plant.



One of the two drag dewatering tanks used for concrete and plaster sands. Note inclosed motor and drive.

At the plant the truck discharges its load from a ramp over a 14-inch rail grizzly into a 10-cubic yard hopper. A reciprocating feeder discharges the material on a 2- by 8-foot Seco 1-deck vibrating scalping screen with 1⅝-inch openings. The oversize gravel goes into a 12- by 20-inch Austin-Western jaw crusher from which the crushed gravel is discharged with the material falling through the grizzly on an 18-inch by 24-foot Columbus belt-conveyor.

A chain-bucket elevator feeds the material to the top of the plant,

This view shows the arrangement of the plant hopper, feeder, scalping screen, crusher and conveyor to bins.

Shovel loading one of the 4-cubic yard trucks in the pit.

where it is discharged on a 3- by 12-foot Seco 2½-deck vibrating scalping screen which does all the gravel sizing. Usually the top deck of this screen has half ¾-inch and half 1⅛-inch wire cloth in that order. Under the lower or 1⅛-inch

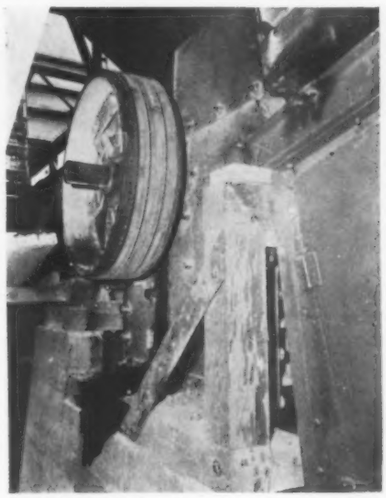
Single-deck scalping screen and feeder. Crusher feed box in foreground.

half of this deck is the half middle deck which has ⅝-inch cloth. The bottom deck has two feet of ⅛-inch and 10 feet of ¼-inch wire cloth. With this arrangement three sizes of gravel are made—1⅝- to 1⅛-inch, 1⅛- to ⅝-inch, and ⅝- to ¼-inch. The two sizes of gravel are discharged by gravity into two of the three 50-ton compartments which form one-half of the 300-ton steel bin. The pea gravel is discharged into one of the two 75-ton compartments in the other half of the bin.

What goes through the ⅛-inch section of the bottom deck is plaster sand, while the material passing through the ¼-inch section is concrete sand. Each of these two products goes to a separate dewatering drag tank. The plaster sand is discharged into the third 50-ton compartment and the concrete sand into the second 75-ton compartment. Trucks are loaded under all these compartments through lever-operated arc gates. Under each of the gravel gates there is a rewashing arrangement consisting of a stationary screen and a perforated spray pipe. Any fine material washed through these screens is carried away through waste pipes.

The company owns two International trucks which are used for making deliveries. When additional trucks are needed they are hired. All shipments are weighed on a Fairbanks truck scale at the attractive concrete-block office building.

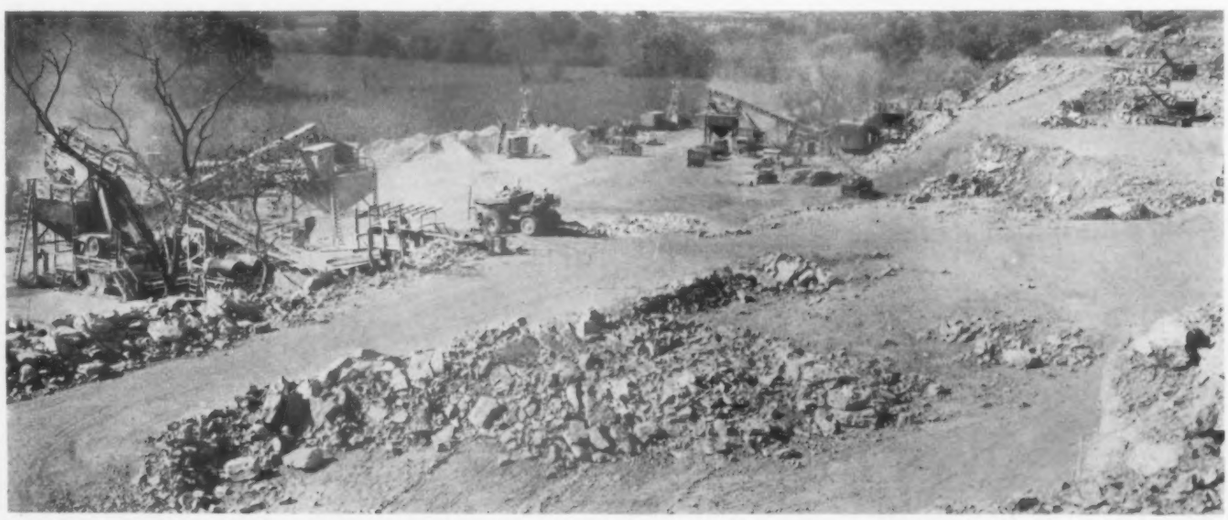
The primary crusher is driven through V-belts by a 35-horsepower Allis-Chalmers motor and the scalping screen is driven through a flat belt from a flywheel of the crusher. The belt-conveyor is driven through Worthington V-belts by a 3-horsepower motor. The feeder and bucket-elevator are driven by chains from the tail and head pulleys of the conveyor. The sizing screens and the two sand-drags are driven by small individual motors. The wash water for the plant is supplied by a Gould 350-g.p.m. pump driven by a 15-horsepower direct-connected General Electric motor.



The 12- by 20-inch jaw crusher and its V-belt drive.

Most of the product is ordinarily used for building and road construction within a radius of 20 miles. No war plants or other government projects have been built in this area but within the past year there has been considerable expansion of the producing facilities of the Pennsylvania oil field. The plant is located near the northern edge of this field and has supplied much of the aggregates used in this work.

Portable Plants Process Aggregates for Kansas Ordnance Job



Three Diamond portable crushing-and-screening plants are working at top speed "somewhere in Kansas" to produce the aggregates needed in erecting the Sunflower Ordnance Works, a $100,000,000 munitions project. The aggregates are being produced by the Midwest Pre-Cote Company and production has been carried out at the rate of over 100,000 tons per month. This rate has been stepped up considerably and the units are in service 20 hours daily. Approximately 50 per cent. of the material produced is smaller than 1½ inches in size.

Eliminating Hazard of Sharp Ends on Cable

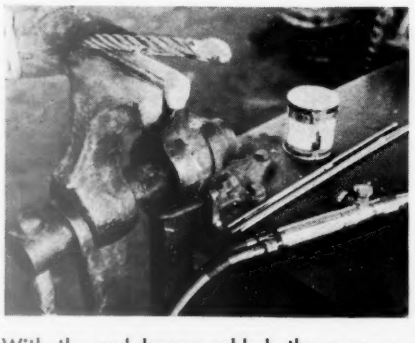
Where use is made of clip fastenings or other means of attachment that expose the end of a wire rope, there is constant danger that those handling the rope may receive lacerations or punctured wounds from the sharp wires at the rope end. This form of injury is said by some medical authorities to be especially dangerous since it is likely to be deep seated, and the injured man may consider the wound as too superficial to require immediate attention. It is not uncommon for blood poisoning to develop from such wounds where immediate treatment is not given.

A simple method of eliminating the hazard of sharp exposed rope ends is to braze the end of the rope with a bronze welding rod, running the bronze back for a distance of an inch or two from the end. When properly done, the bronze covers all the wire ends, and it also has the advantage of holding the rope end intact so that seizings can be removed.

The ends of preformed ropes can be brazed without applying a seizing beforehand, since preforming removes all the unbalanced stresses in the rope wires and strands so all the wires hold their position in the rope without the need for using seizings. Even so, a single seizing will insure that the rope construction will not be flattened during the cutting operation. If the rope is not preformed, it is recommended that two or three seizings be applied, one close to the end of the rope and the others a short distance apart.

Where end brazing is done, either the same torch or a cutting torch may be used to sever the rope before bronze is applied to the end.

Covering the sharp end wires by applying bronze with welding torch.

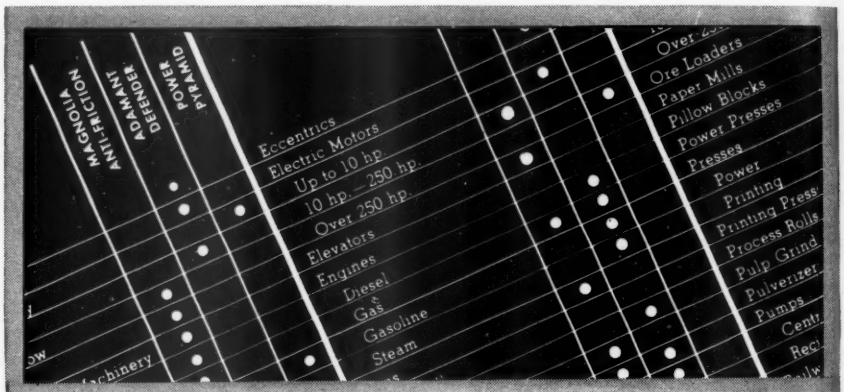


With the end bronze-welded, the rope can be handled without danger of injury.

"Vienna" Lime Useful as Buffing Compound

"Vienna lime" is a high-magnesian lime analyzing around 55 per cent. calcium carbonate and 43 per cent. magnesium carbonate with traces of silica, iron and alumina. Its principal use is for buffing numerous materials, such as nickel, brass, copper, pearl, celluloid, and other metal and manufactured articles, and for imparting an under surface blue to nickel after plating.

In the manufacture of Vienna lime, high grade dolomite is carefully calcined by a special process, then cleaned, ground, packed in sealed containers, and sold to manufacturers of buffing compound. In selecting dolomite for this product, not only the chemical composition of the stone but also its texture, porosity, crystallinity, and even its fossil origin are significant.



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FOR EVERY APPLICATION

There is no one bearing alloy suitable for all types of machinery used in producing cement, crushed stone, gypsum and other nonmetallics. In some cases, conditions call for an alloy offering good resistance to compression plus excellent anti-frictional qualities. Under extreme conditions, some of the anti-frictional qualities must be sacrificed to obtain malleability or hardness. Insist on a metal that has been "alloyed" for your application.

90% of bearings in use today are subject to uniform speed and only moderate pressures, as in electric motors, line shafting and general machinery. For such services, use Magnolia Anti-friction Metal.

For shock loads, which would crack the harder bearing metals, use lead-base Defender or tin-base Adamant, tough yet malleable metals. Internal combustion engines and trap-rock crushers are typical applications (although some plants use Magnolia Anti-friction Metal for all applications.)

When bearings are subjected to heavy sustained pressures, use lead-base Pyramid or tin-base Power, hard metals which will not squeeze out.

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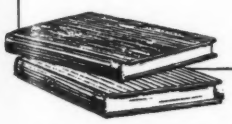

THE PRESIDENTS AND CIVIL DISORDER. *By Bennett Milton Rich. 232 pages. Published by the Brookings Institution, Washington, D. C. Price $2.00.*

The threat of civil disorder is ever present. Unpopular laws, political struggles, racial conflicts, and especially labor disputes, have, in times past, resulted in serious rioting and bloodshed. To enforce the peace, many presidents, including Washington, Jackson, Cleveland, and the Roosevelts, have made use of the armed forces of the nation.

This study shows how the presidents have handled the major instances of domestic disorder. The Whiskey Insurrection, the Dorr Rebellion, the Great Railroad Riots of 1877, the Pullman Strike, the Bonus Marchers, and the strike at North American Aviation—in these disturbances and others—the role of the president is considered in detail.

Emphasis has been placed upon the manner in which the presidents have made use of the Army, together with the methods employed by the armed forces to terminate the disturbances. Following are some of the problems considered. Have the presidents sent the troops at the first sign of disorder or only as a last resort? What restrictions have been placed on the inhabitants of disturbed areas? Has the Army been unduly harsh in its task of enforcing the peace?

In addition to giving an account, based largely on official records, of the major instances of disorder, the study analyzes the legal bases for presidential intervention in instances where the domestic peace is endangered.

* * *

PERSONNEL MANAGEMENT AND INDUSTRIAL RELATIONS. *By Dale Yoder. 847 pages. Published by Prentice-Hall, Inc., New York City. Price $4.25.*

Personnel and Labor Relations, the predescessor of this book, appeared in the midst of wide-spread depression and unemployment. To-day man-power is at a premium. The whole field of industrial relations is highly dynamic. Under such circumstances the most essential characteristic of effective personnel administration is its constant self-appraisal and evaluation. Policies and practices must be constantly scrutinized and weighed in terms of their appropriateness and effectiveness. The continual testing of each phase of the industrial-relations program, as a basis for constant readjustment, innovation, and adaptation, is the elementary requisite of a satisfactory program in these years of rapid change.

The present book reflects the valuable suggestions of those who made extensive use of the previous volume. The techniques of statistical materials, excepting for a preliminary chapter on the simpler devices, have been brought together at the close of chapters in special sections. They may, for this reason, be omitted by those who prefer to emphasize the descriptive aspects of modern personnel administration. At the same time, they are available for those who wish to use them. Another change involves the more extensive reference, throughout the book, to psychological contributions to the field, while another is the expansion of the discussion of collective bargaining. Throughout, additional questions and exercises on each chapter have been provided. A new chapter on personnel records rounds out the description of present practice.

* * *

SOCIAL INSURANCE AND ALLIED SERVICES. *By William Beveridge. Published by Macmillan Company, New York City. 299 pages. Price $1.00.*

This much discussed volume outlines a post-war plan for social insurance in Great Britain against interruption and destruction of earning power, and for special expenditure arising at birth, marriage, or death.

The plan embodies six fundamental principles: (1) Flat rate of subsistence benefit, irrespective of amount of earnings; (2) flat rate of contribution, irrespective of means; (3) unification of administrative responsibility in the interests of efficiency and economy; (4) adequacy of benefit in amount and in time; (5) comprehensiveness in respect both of persons covered and of their needs; and (6) classification, taking into consideration the different ways of life of different sections of the country.

* * *

FACT AND FANCY IN THE T.N.E.C. MONOGRAPHS. *Edited by Noel Sargent and John Scoville. 832 pages. Published by H. W. Wilson Company, New York City. Price $3.00.*

What our future economic life might be, as seen through the eyes of the Temporary National Economic Committee and its professional staff, has been recorded in 12,000 closely printed pages, published in 43 monographs issued by the Government Printing Office.

These monographs cover a wide range of topics—industry, trade, agriculture, insurance—production, distribution, competition, monopoly, wages, prices, etc.—and the relation of government to our economic life. Some of them have been carefully done—some are based on partial information or have missed some of the implications of the subject. Some are impartial—others have a "thesis" to prove. They include proposals of many kinds—practicable and theoretical—constructive and destructive — evolutionary and revolutionary.

Ironically, the very size of these monographs will prevent their careful study by those most vitally concerned with their content. For this reason, Noel Sargent, secretary of the National Association of Manufacturers, assisted by John Scoville, chief statistician of the Chrysler Corporation, have analyzed these monographs, combed out their essential content and assembled them with a critical review of each, in one handy compact volume. The reader will find in one place a careful digest of these monographs, side by side with the opposing arguments or points of view when these exist, thereby doubling the value of the work as a reference tool.

Army-Navy "E" awards for excellence in production have recently been awarded the Allis-Chalmers Manufacturing Company (Springfield, Illinois plant); Bucyrus-Erie Company, South Milwaukee; Clyde Iron Works, Duluth; R. G. LeTourneau, Inc., Peoria, Illinois and Stockton, California; National Supply Company, Toledo; and the MacWhyte Company, Kenosha, Wisconsin.

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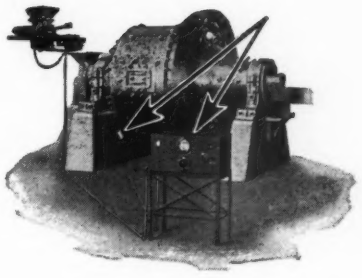

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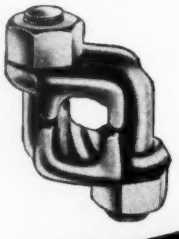

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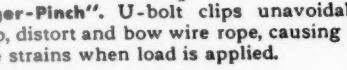

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PERSONAL MENTION

BERNARD E. GRAY has been promoted to the position of general manager of the Asphalt Institute, adding the duties of that office to those already held as chief engineer. Mr. Gray has been with the institute for the past thirteen years, successively as highway engineer, chief highway engineer and chief engineer.

CLINT MERRIS, foreman at the Fort Gibson plant of the Muskogee Sand & Gravel Company, Muskogee, Oklahoma, suffered the loss of his left foot and a fractured thigh when he was run down by a railroad car at the plant recently.

EARL N. PIXLEY of Delevan, New York, has been named successor to the late Harry W. Vickery, former superintendent at the Franklinville sand-and-gravel operations of the Buffalo Slag Company.

HENRY R. SCHAEFER has been elected president of the Globe Plaster Company of Buffalo, New York, succeeding his father, the late Henry Schaefer. The new president was vice-president for a year and secretary seven years. FRED W. SCHAEFER, a cousin, has been promoted from secretary to vice-president. ERNEST T. CLOUGH has been chosen secretary. He formerly was sales manager.

JOHN R. WARK, sales engineer for the Queen City Sand & Supply Company, Buffalo, has received a commission as lieutenant (j.g.) in the U. S. Naval Reserve and has left for active duty at Pensacola. Mr. Wark is secretary of the Western New York Chapter, American Foundrymen's Association.

C. L. CUMMINS, founder-president of the Cummins Engine Company of Columbus, Indiana, has been appointed executive consultant on Diesel-engine production to the War Production Board, with headquarters in Washington, D. C. The position carries the nominal dollar-a-year salary.

ED WALKER, assistant engineer of Dickinson County, Kansas, has resigned to become an operating executive for the Walker Gravel Company of Junction City, Kansas.

HARVEY T. MUDD has been appointed chief of the fluorspar section, Office of Operations, War Production Board, Washington, D. C.

HOMER A. HUMPHREY of Chicago, a Portland Cement Association soil-cement engineer, was the speaker at a meeting of contractors and engineers at Charleston, West Virginia, recently.

HENRY M. HELENIAK, 64, vice-president and sales manager of the Spokane Portland Cement Company died March 5 in a Spokane hospital. He had been ill only a few days. He had been a resident of Spokane for 33 years, having come to the Pacific Northwest in 1910 from Minnesota to take employment with the Great Northern Railway.

WILLIAM F. WADE, 52, sand-and-gravel producer at Dodge City, Kansas, died recently after a two-months' illness.

GEORGE H. BALFE, general manager of the Monon Crushed Stone Company, Monon, Indiana for more than 20 years, died recently at the age of 68 at his home in La Fayette, Indiana. He was a past president of the Indiana Crushed Stone Association. His widow, a son and a daughter survive him.

FRANKLIN R. DARLING, 25, died in a hospital at Mt. Vernon, Ohio, on February 15 after suffering a fractured skull in a steam-pipe explosion at the Millwood sand plant, east of that city. He was attempting to thaw out the steam line when the explosion occurred.

MICHAEL L. MCGUIRE, foundry consultant of George F. Pettinos, Inc., Philadelphia industrial-sand operator, died in January.

GEORGE F. FLETCHER, 55, vice-president of the Mica Company of Canada and New York and superintendent of the company's Massena, New York plant died at Ogdensburg, New York, recently.

HAL S. COVERT, 55, manager of the Southern States Lime Corporation of Crab Orchard, Tennessee, died recently in a Knoxville hospital. He was widely known among southern lime operators and for many years had been secretary of the Southeastern Lime Institute.

DR. CHARLES H. KRAUSE, 69, vice-president and treasurer of the Columbia Quarry Company of St. Louis died in February. Heart disease was the cause of death. He

was graduated from medical school in 1892 and practiced for five years, giving up his practice to manage the quarry company. He is survived by his brother, E. J. Krause, president of the Columbia Quarry Company, his widow and one son, Edward.

SHELTON G. DOWELL, 62, who was associated with the Arizona Gypsum Plaster Company of Douglas, Arizona, for more than 25 years and who retired as manager last year, died recently at a hospital in Houston, Texas.

J. R. BENT, agricultural sales manager of Dolese & Shepard, Chicago, died March 6 at the age of 66 years. For 12 years he had been secretary of the Illinois Agricultural Association and in recent years had been secretary of the Midwest Agricultural Limestone Institute.

J. W. GARDNER, 79, died recently after a long illness. He was associated with the Gardner-Denver Company from 1881 until ill health forced him to withdraw from active participation in business several years ago. During his period of active management, he served as president, chairman of the board and finally as chairman of the excutive committee.

WILLIAM O. WALTON, president of the Huntington Sand & Gravel Company, Huntington, West Virginia, died February 18. He was also prominent in real-estate circles and was a former sheriff of Cabell County.

O. E. WASSON, formerly general manager of the old Knickerbocker Cement Company at Hudson, New York, before the plant was taken over by the Lone Star Cement Corporation several years ago, died of pneumonia in Battle Creek, Michigan, a few weeks ago.

The Hercules Powder Company has opened sales offices in Boston for its cellulose products, naval stores, synthetics, explosives and paper-makers' chemical departments. The offices are on the seventh floor of the Statler Office Building.

A convenient battery-replacement table for gasoline or Diesel-powered off-the-highway equipment such as tractors, excavators, compressors, etc., is being supplied by the Electric Storage Battery Company, Philadelphia. This bulletin, No. 3764, may be obtained by writing the company direct.

The Robins Conveying Belt Company of Passaic, New Jersey, announces the appointment of John T. Hoyt as comptroller and R. C. Gray as works manager.

A New Dredge Design of Compact Completeness and Strength that makes for Long, Continuous Service

The Flint Sand & Gravel Company, Inc., New Orleans, Louisiana, producers of concrete aggregates, in the fall of 1940, at their Bluff Creek, Louisiana plant, commissioned a new pump dredge, the latest addition to their excavation equipment. It is 10-in. pump size, with 12-in. plain suction line. The hull, 28′-0″ by 45′-0″ x 4′-0″, is all-welded steel construction of three fore-and-aft pontoon sections, with field bolted assembly. The center section is open deck, having main equipment sub-bases framed integrally, forming an engine cockpit. The two side pontoons with flat decks, support auxiliary equipment and contain fuel oil tanks. The "A"-frame and boom are steel. The cabin is timber framed and wood siding.

For production, a 10″ Amsco, Type "H-CF", Form 40 Heavy Duty Dredge Pump is used. It is "Counterflow" water seal construction, right hand, 30 degree upturn discharge. Individually powered, it is directly connected to a diesel engine, 8 cylinders 9″ x 12″, developing 315 H.P. at 514 R.P.M.

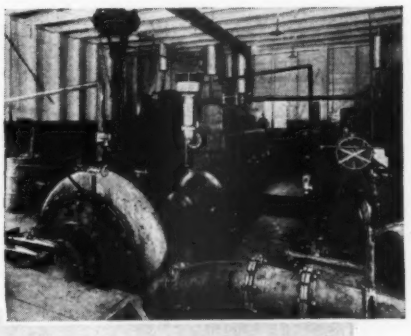
The operator's position is forward. The hoist, straddling the deck level suction line, is electric motor powered.

A 40 H.P. auxiliary diesel power unit drives a 20 K.W. generator producing direct current of 250 volts and is directly connected to a 3″ size, two-stage, general service centrifugal water pump. An additional 12 H.P. auxiliary diesel power unit is available for driving a 5 K.W. generator, a water pump for bilge and stand-by fire protection, and the air compressor. Every facility is provided for adequately servicing all power equipment.

The dredge pump water end parts and all hull pipe line fittings are made of Amsco impact and abrasion resistant manganese steel, "The Toughest Steel Known."

The entire undertaking is more than just a fine piece of machinery. It is well planned and built with staunchness that exemplifies "fitness of purpose." It is compact, simple in arrangement, trim in appearance, and judged by performance, in almost continuous day and night service since its commission, it has proved to be most "Dependable and Economical."

A bulletin is available completely describing Amsco Dredge Pumps, Rotary Cutters, and Pipe Line Fittings.



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Legal Decisions

By LEO T. PARKER

F. O. B. Shipments

When a contract contains the stipulation "f. o. b. seller's plant" the purchaser always is solely responsible for the loss of, or damage to, the merchandise during its transportation. If the damage is caused by a common carrier, the purchaser may collect the damages from it, and the seller's responsibility ceases, as far as damage to the material is concerned, when he delivers to a common carrier material conforming in quality to the terms of the sale contract, which contains instructions to ship f. o. b. the seller's plant or city.

For example, in *Empire v. Jones,* 9 So. (2d) 513, it was shown that goods were sold under a contract which specified f. o. b. the seller's location. These goods were damaged. In holding the seller not liable, the court said:

"The contract between the Southern Company [purchaser] and the Empire Company [seller] stipulated that the merchandise was sold net f. o. b. plant and, hence, delivery to the carrier at that plant was delivery to the purchaser of the brick."

If the contract had specified f. o. b. the purchaser's delivery plant, the duty would have rested upon the seller to deliver merchandise to the purchaser in good condition.

New Silicosis Cases

The modern higher courts recognize that silicosis is produced primarily and exclusively by the free silica in the air that is breathed. The particles of free silica that produce the condition of silicosis are microscopic in size, and the minimum number of microns of free silica which constitutes a dangerous exposure must be over 5,000,000 per cubic foot of air.

Formerly the existence of this disease was recognized and named "stone-cutters' consumption." Probably within the last ten years it has been recognized as an "occupational" disease to which persons other than stone cutters may be subjected by reason of their inhalation of silicate or quartz dust.

In order to reduce the hazards of silicosis places of employment must be provided with safety devices. Almost all states have adopted statutes which provide that no employer shall require, permit or suffer any employee to go or be in any employment or place of employment which is not safe. In fact, according to law, no employer shall fail or neglect to do every other thing reasonably necessary to protect the life, health, safety and welfare of such employees.

The terms "safe" and "safety" as applied to any employment or place of employment are used to indicate "such freedom from danger to the life, health, safety or welfare of employees or frequenters as the nature of the employment will reasonably permit. Failure of employers to conform with these legal requirements entitle the employees to sue for heavy damages instead of accepting the conservative sums specified by state compensation laws. Therefore, every employer should familiarize himself with and abide by the provisions of the statutes of the state in which he operates his business."

However, modern higher courts have taken the stand that if the disease did not result from the employer's negligence the employee can not recover damages, although the employer failed to conform with state laws.

For example, in *McKee v. New Idea,* 44 N.E. (2d) 697, it was disclosed that an Ohio state law provides that where dust is injurious to the health or eyes of employees and where a natural circulation of air does not carry off such dust, hoods, ventilators, fans or other means of ventilation of sufficient capacity to effect four air changes an hour shall be installed and operated.

An employee claimed that he had contracted silicosis while attending to his regular work. He sued to recover compensation and testified that silica dust arose and was prevalent in the room in which he worked and further that his employer had not complied with the above-mentioned state law. In view of this testimony the lower court held the employee entitled to recover $15,000 damages from his employer. However, it is interesting to observe that the higher court reversed the verdict. This court held that since no proof was given that the employer was negligent, although he violated the state laws, such employer was not liable.

Generally, the occupation-disease compensation acts are more limited than the workmen's compensation acts as respects disability or death resulting from silicosis.

According to a modern higher court, where a disease causes the death of an employee who was suf-

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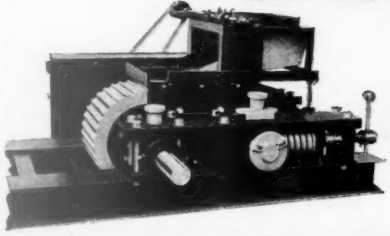

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fering from silicosis and the disease was not brought about by silicosis but the only effect silicosis had was to lower his vitality and weaken his resistance to it, the death is not within the workmen's occupational-disease compensation act. In other words, under conditions where silicosis only contributes to the death of an employee his dependents can not recover compensation for his death.

For example, in *Stauffer v. Hubley Manufacturing Company,* 30 Atl. (2d) 370, reported March, 1943, it was shown that a Pennsylvania state law provides that compensation shall not be payable for partial disability due to silicosis, anthraco-silicosis, or asbestosis. The law also provides that compensation shall be payable for total disability or death caused solely by silicosis, anthraco-silicosis, or asbestosis, or by silicosis, anthraco-silicosis, or asbestosis when accompanied by active pulmonary tuberculosis.

An employee, named Howard, had worked for a company for about twenty-five years. His occupation exposed him to the hazard of silicosis. About three years before his death he consulted a physician who diagnosed his trouble as acute bronchitis, but about two years before his death became convinced that Howard had silicosis and advised him to change his occupation. He was not disabled or laid off because of silicosis, but soon afterward he was unable to work because of what was diagnosed as streptothricosis, a rare, branching fungus type of infection which resulted in an abdominal abscess. He was treated at his home for thre weeks and was then taken to the General Hospital, where the abscess in the upper part of his abdomen was operated on. He stayed in the hospital until his death. Dr. Boughton performed an autopsy and found in the decedent's lung the same positive organism, streptothrix, which had caused the abscess in the abdominal wall.

Howard's wife applied for compensation and the lower court granted her application. However, the higher court reversed the verdict and, in holding the wife not entitled to payment of compensation, said:

"The medical testimony is clear and undisputed that the patient died of the streptothricial infection; that this infection was not caused by or brought about by the silicosis from which he was suffering in a serious stage, except that the silicosis lowered his resistance, so that when he did develop the subsequent infection he had no resistance for it. . . . It is well established in our workmen's compensation law that an accident, or an infection that results from it, which merely lowers the injured employee's vitality and resistance to germ diseases, rendering him more susceptible to them and less able to combat them, is not compensable as respects disability or death resulting from a germ disease or infection not directly caused by the accident.

Supreme Court Rulings

With respect to the Fair Labors Standards Act, it is interesting to observe the holdings of the Supreme Court of the United States made during the past few weeks. In all the decisions this highest court has held broadly in favor of the validity of this federal law.

In *Walling,* 63 S.C.R. 332, it was shown that a company shipped from outside the state certain merchandise that was placed in storage and later delivered to customers within the state. The court held that this was interstate commerce and that the company must pay the wages specified by the Fair Labor Standards Act.

Also, in *Warren,* 63 S.C.R. 125,

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the evidence showed that a company was engaged in drilling wells. It did not own any land, nor did it own any of the oil that was taken from the wells. Its only operation was contracting to drill wells to a certain depth and stop before the oil was discovered. However, the Supreme Court of the United States held that this company was transacting interstate commerce to the degree that it must pay its employees wages specified by this federal wage law. The company pays its employees from $6 to $12 per day, and the court held that it must pay time and one-half on the basis of these wages and not on the basis of the minimum wages specified by the law.

In *Overstreet*, 63 S.C.R. 495, the Supreme Court of the United States held that the owner of a toll bridge, that was used by persons who paid toll to transport goods over the bridge and from one state into another, was bound to pay the bridge employees the wages specified by the federal wage law. In this case the only duty of the employees was to collect toll and while the matter of collecting toll in one state is an intrastate duty, yet the fact that the persons who used the bridge were traveling interstate resulted in the employees being within the bounds of the federal wage law.

Since all these important cases were decided only recently, it is quite apparent that all employers must use great care and not pay less than the minimum wages specified by the Fair Labor Standards Act, as this law gives the employees the right to sue and recover in some instances double the amount due plus lawyer's fees.

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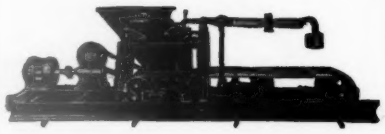

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Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—ED.]

Legal Editor: We have a suit on our hands because recently we threatened to cancel a hauling contract with a trucking company if they continued to delay getting materials loaded, thereby interfering with our employees at the pit. The company claims we are liable for breach of our contract by which we agreed to pay a specified price per ton for a period of one year. Can we be held liable?—J. C.

Answer.—Legally, a breach of a contract is a violation or contradiction of the terms of the agreement. In other words, neither contracting party is entitled to recover damages based upon a breached contract, unless the testimony clearly indicates that a breach of the contract actually occurred. Therefore, the mere fact that a party states that he intends to breach a contract, or performs acts intimating that he will breach the contract, is not sufficient justification for the other to recover damages, unless a breach actually occurs. See the leading case of *Clark v. Miller,* 122 So. 475. Suit was instituted by one of the contracting parties on the contention that certain acts and statements of the other party indicated that he had intended breaching his contract. The court promptly held that a contracting party is not liable for assertions of this nature because no breach is made until the party actually fails to fulfill one or more of his obligations. This court said:

"The mere assertion of a party to a contract that he will be unable, or will refuse to perform his contract, is not sufficient to constitue a breach. There must be a distinct, unequivocable, and absolute refusal to perform, treated and acted upon as such by the other party to the contract. A mere assertion of inability to go on with the contract is not a repudiation of the contract."

Therefore, in view of this case it is apparent that you are not liable for merely threatening to breach the contract.

Simplifying the law on this subject: All parties to a valid contract are bound to fulfill the precise terms of the agreement. If one contracting party fails in this respect he performs an illegal act which entitles the other party to do either of these three things: (1) he may refuse to continue to perform his obligations and sue the other party for damages and profits in an amount equal to his financial loss resulting from the breach; or (2) he may file suit and compel the other party to fulfill the exact terms of the agreement; or (3) the parties may mutually agree to cancel the old contract and make a new or supplementary contract.

* * *

Legal Editor: Recently we rented a truck and its driver at $3.50 per hour. Through negligence of the driver the truck was wrecked. Are we liable for the cost of repairs?—C. C.

Answer.—The leading higher-court case involving this point of law is *Kennedy v. B. A. Gardetto,* 27 N.E. (2nd) 957. The facts of this

PERFORATED METAL SCREENS
FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.
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Prompt Shipment

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case are that certain equipment was rented by a bailor to a bailee, as yourself, who failed to use care in safeguarding the equipment. The higher court promptly held the bailee liable in full damages to the owner of the truck, and said:

"It is a general rule of bailments that the duties of the hirer are to return the bailed property in as good condition as it was in when received, necessary wear and tear excepted, unless injured without his fault, and to pay the agreed compensation. Limitations of these duties may be fixed by the terms of the contract, or by usage, but in the absence of an agreement, express or implied, they are a part of the contract of bailment."

In view of the law laid down by the higher court in this case you are liable for the full amount of damages caused as the result of the driver's negligence. However, certain established points of law must be kept in mind. For instance, in cases of this nature the evidence must disclose that you assumed control over the driver. Also, the truck owner is legally obligated to supply a driver known to be competent. If he supplies one known to be incompetent from lack of experience, defective eyesight, excessive indulgence in alcoholic drinks, or otherwise a known unreliable motor-vehicle driver, you are not liable for damages resulting from such incompetency.

On the other hand, if the driver is competent and you controlled the driver and had a right to direct him, then, under these circumstances, you are solely responsible for injuries to persons or property resulting from his negligence. Generally, where a company hires a truck and its driver for a specified hourly payment, the court assumes that the one who uses the truck is the legal employer because he directs and controls the driver for the number of hours in which he uses the truck and its driver.

* * *

Legal Editor.—Our company entered into a contract with a seller for the purchase of a large quantity of merchandise. In the contract was a clause that required arbitration in the event any controversy arose. Now the seller refuses to complete the contract and deliver the merchandise because the government-established "ceiling" price is lower than the contract price. Can the arbitrators, under this arbitration clause, decide our rights?—W. S. G.

Answer.—Modern higher courts hold that a seller is not obligated to deliver merchandise to a purchaser where, after the contract was made, the federal government established a "ceiling" price. Moreover, the prior agreement to arbitrate, which you mention, does not affect this new law.

For example, in the late and leading case of *Kremer,* 43 N.E. (2d) 493, a contract for the purchase of merchandise between a buyer and seller clearly stipulated that any controversy arising under or in relation to this contract should be settled by arbitration. The seller contended that the establishment of a "ceiling" price invalidated the contract and that he was not required to make delivery at a price lower than the contract price. However, the purchaser contended that this was a matter of arbitration. It is important for you to know that the higher court refused to permit arbitration, and held that the contract need not be performed by the seller since the contract was automatically cancelled by the "ceiling" price which was less than the price the purchaser had agreed to pay for the merchandise.

The W. W. Sly Manufacturing Company of Cleveland, has appointed Edwin S. Armstrong as district manager for the Milwaukee District, including the greater part of the state of Wisconsin. His headquarters are at 7936 Rogers Avenue, Wauwatosa, suburb of Milwaukee.

METAL MINING NEWS
PSC CARS GIVE 24 HOUR-A-DAY PERFORMANCE . . .
ELIMINATE TIME-OUTS FOR REPAIRS SAY MINE OPERATORS
Low-maintenance PSC Cars prevent lagging schedules—keep war-time production on the move! They're rugged, tough and durable, built to move 24-hours every day with no time-outs for maintenance.
Bulletin No. 71 describes the complete PSC line of dependable cars for all haulage requirements. Let us send you a copy for your files.
PSC
PRESSED STEEL CAR COMPANY, INC.
INDUSTRIAL DIVISION
PITTSBURGH, PA.

TRAFFIC News Digest

I. C. C. Reports

Granite.—Docket No 28835.—Lloyd Brothers Company *et al v.* the Grand Trunk Western Railroad Company *et al.* Examiner M. J. Walsh. Dismissal proposed. Rates on granite, in carloads from Barre and Hardwick, Vermont, to Detroit, Michigan, shipped between January 1, 1937, and September 3, 1940, proposed to be found applicable and not shown to have been otherwise unlawful. It was stated in the report that the interpretation which complainants sought to have the commission place on the tariff items would have the effect of continuing rates to destinations in the United States differing materially from those approved by the commission in Consolidated Stone Cases, 200 I. C. C. 65.

Phosphate Rock.—A downward adjustment in rail rates on phosphate rock from the Pebble Rock district of Florida to Chicago, Chicago Heights, East St. Louis and Joliet, Illinois, New Orleans, Louisiana, Bessemer and Mobile, Alabama, and Gulfport, Hattiesburg, and Jackson, Mississippi, effective to a date six months after the conclusion of a treaty of peace, in the absence of competitive water-borne transportation, is suggested in a proposed report by Examiner George Esch, in fourth section application No. 18573, Phosphate Rock from Florida to Illinois and the South, and cases joined therewith, recommending grant of fourth-section relief to establish and maintain such reduced rates. The relief was allegedly sought to meet competition on waterways to retain and attract certain of the traffic to the rails.

The examiner recommended that the commission authorize the applicants for the temporary period to establish and maintain over their existing all-railway routes from the pebble-rock district in Florida basic rates not lower by the gross ton than $7.60 to Chicago, Chicago Heights and Joliet; $6.34 to E. St. Louis; $3.81 to New Orleans; $3.56 to Gulfport; $3.31 to Mobile; $4.83 to Bessemer; $5.10 to Jackson; and 4.80 to Hattiesburg. These rates are subject to the 3 per cent. increase granted in Ex Parte 148. The relief is proposed to be made subject to the 50 per cent. circuity limitation provision.

Motor Reports

Cambridge, Massachusetts.—MC 57558, Sub. 3.—Euplio Poaletta, extension. Certificate granted. Road and building materials between points in Massachusetts located within 50 fifty miles of Cambridge, Massachusetts, over irregular routes.

Ouray, Colorado.—MC 104163.—William J. Smith, common carrier. Certificate proposed. Ore, between points within 20 miles of Ouray, Colorado, including Ouray.

Barre, Vermont.—MC 42828, Sub. 2.—E. Serrani & Son, extension. Certificate recommended. Granite, rough and finished, Barre, Vermont, to West Long Branch, New Jersey.

Central Freight Association

Docket 72831.—(Carrier's proposal)—Sand and gravel, carload, in open-top cars. Cancel the present rates published on page 24 of B. & O. R. R. Tariff H—3612—A, from Carlisle, Ohio, to various points in Ohio, and similar rates in other individual lines' tariffs. Classification basis to apply.

Docket 72855.—(Carrier's proposal—Cement, common, hydraulic, masonry, mortar, natural and Portland. Carload. Minimum weight 50,000 pounds. Establish a rate 18 cents from Painesville, Ohio, to Manistique, Michigan.

Docket 72870.—Cement.—Revise rates from all origins in Official Territory to Springfield, Vermont, located on the Springfield Terminal Railway, 1 cent over those presently applicable to Charlestown, New Hampshire.

Docket 72928.—(Carrier's proposal) — Stone, crushed; stone screenings, in bulk in open-top cars, straight or mixed carloads. Establish a rate of $2.48 per net ton from Marengo and Milltown, Indiana, to Barberton, Ohio. Subject to Ex Parte 148 increase.

Docket 72964.—(Carrier's proposal)—Lime, common, hydrated, quick or slaked, carload minimum weight 30,000 pounds and 50,000 pounds, also mortar, dry building, carload minimum weight 30,000 pounds. Establish from C. F. A. and T. L. A. lime and mortar shipping points to Kobuta, Pennsylvania, commodity rates on prevailing established relationships with existing commodity rates on lime and mortar, carload, from C. F. A. and T. L. producing points to Chester, West Virginia and Monaca, Pennsylvania. Subject to Ex Parte 148 increase.

Docket 72965.—(Carrier's pro-

FARREL BACON CRUSHERS

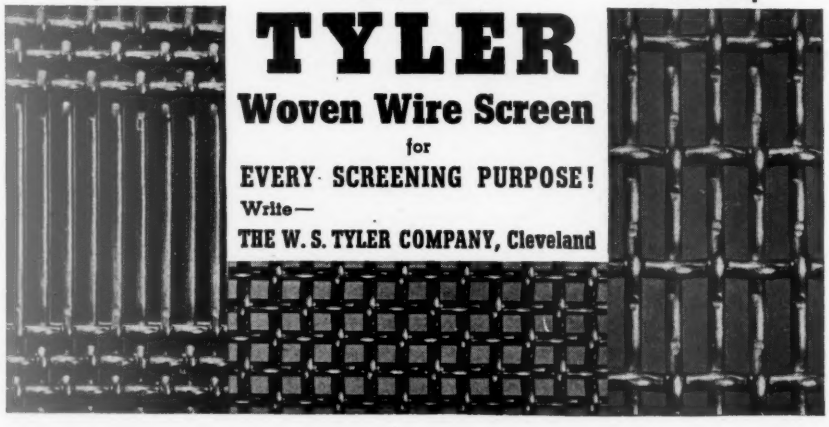
Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.

EARLE C. BACON, Inc.
17 John St. New York, N. Y.

Ty-Rod THERE IS A Ton-Cap

TYLER Woven Wire Screen for EVERY SCREENING PURPOSE!

Write—
THE W. S. TYLER COMPANY, Cleveland



posal)—Plasterboard, carload; plaster articles carload, and gypsum products, carload. Established commodity carload minimum weights. Establish from C. F. A. and T. L. A. territory producing points to Kobuta, Pennsylvania, same commodity rates as presently published to Pittsburgh. Subject to Ex Parte 148 increase.

Docket 72996.—(Shipper's proposal)—Limestone, agricultural, unburned, not ground or pulverized, in bulk in open-top cars, carload. Establish from Luckey, Ohio, to Alvordton, $1.05; to Blakesley, Edgerton, Edon, $1.10; to Hicksville, $1.16; and to Montpelier, Ohio, $1.05 per net ton. Subject to Ex Parte 148 increase.

Docket 73009.—(Shipper's proposal)—Blocks, building, solid, hollow or perforated, made of cement or concrete, not reinforced with metal, except enameled, individual blocks not being packed. Carload minimum weight 60,000 pounds. Rule 24 of Official Classification not to apply. Establish a rate of $1.49 per net ton from Cincinnati to Dayton, Ohio.

Docket 73021.—(Shipper's proposal).—Blocks, building, solid, hollow or perforated, made of cement or concrete, not reinforced, with metal, except enameled, individual blocks not being packed. Carload minimum weight 60,000 pounds. Rule 24 of Official Classification not to apply. Establish a rate from Cincinnati to Wright, Ohio, $1.49 per net ton. Establish from the same point of origin a rate of $1.82 per net ton to Osborn, Ohio. Subject to Ex Parte 148 increase.

NEW MACHINERY and SUPPLIES

● V-Belt Redesigned

A new plan to save 250,000 pounds of crude rubber this year—an amount equal to the yearly produce of 25,000 rubber trees—has been announced by Walter Geist, president of Allis-Chalmers and inventor of the multiple V-belt drive. The program calls for "wartime drives" using shorter center distances and larger sheaves on all new applications made in 1943.

"The plan is geared to present design limitations," said Mr. Geist, "and only slight changes in dimensions are necessary to save a quarter million pounds of crude rubber."

Although engineering of individual V-belt drives has been governed in the past largely by such considerations as convenience, habit and machine design, to-day the most important consideration is the saving of rubber for our dwindling stock pile, Mr. Geist pointed out. However, he added, the plan should not be regarded as a temporary, wartime expedient, for the increases are sound and practical—in line with a long-range trend to larger diameters.

By following the program, nearly every field of industry would actually contribute hundreds of pounds of rubber to the war effort. Every buyer of new V-belt drives would not only aid the war effort, but could individually save, on the average, $15 out of every $100 they spend on new drives and $35 of every $100 ordinarily spent on replacement, according to the plan.

Details of the new program and how it can be applied to representative applications are explained in the current issue of the Allis-Chalmers publication, *Texrope Topics.*

This huge steam shovel was contributed to the scrap drive recently by the Equipment Corporation of America, Chicago. Weighing 666,000 pounds, it carried a 90-foot boom and a 6-cubic yard dipper.

This trowel had thirty lives!

Even after shaping 30,000 feet of concrete pipe, the surface wear it showed was within permissible tolerance!

EMPLOYED FOR SHAPING the bell-end of machine-made concrete pipe, this revolving trowel had to continuously withstand the grueling abrasion of crushed stone, sharp sand, and cement aggregate. A terrific punishment! Neither Swedish steel nor hardened tool steel could take it! Even a trowel cast of alloy steel quickly succumbed so that costly replacement became necessary every 800 feet.

Finally, Coast Metals Hard-Facing was tried. The trowel was made of a low carbon steel, cast undersize and then built up to dimensions with an exceptionally wear-resistant Coast Metals Coating. The results proved outstanding! Over thirty times the best service previously obtained!

Why not try Coast Metals Hard-Facing in solving *your* wear-resistance problem?

COAST METALS, INC.
Plant and General Offices: Canton, Ohio
Executive Offices: New York, N.Y.

COAST METALS
hard-facing weld rods

YOUR EQUIPMENT'S LIFE PRESERVER AGAINST WEAR

"HAPPY LANDING"
place for a pep-restoring rest on an inner-spring mattress in a noise-proofed, comfortable room . . . then a satisfying meal, and a fresh start.
hotel Mayfair
St. Louis
Over 50% of all rooms $3.50 or less single
42 H M 72

It's a Fact!

PIT AND QUARRY

Has More Than

Twice as Many

Paid Subscribers

Among Producers

of Sand and Gravel

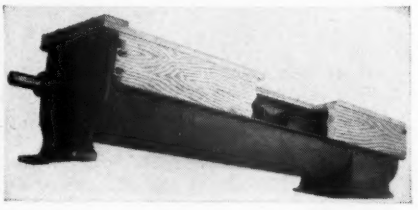
as Any Other

Magazine Serving

This Field

● Screw-Conveyor

The Link-Belt Company, Chicago, announces a screw-conveyor trough that is made of a combination of steel trough bottom, wooden sides, and wooden cover board, lag-screwed together to form a complete, tight inclosure for the screw and the material it conveys. A substantial percentage of steel is saved compared to the all-steel trough and cover plate heretofore furnished.



Wooden sides and top save conveyor-trough steel.

A new combination wood and steel trough is adapted to all standard screw conveyor fittings; will readily connect with existing steel trough; and can be shipped with sides and bottom assembled.

The curved bottom will be made of steel no heavier than No. 10 gauge, and has the added advantage of being removable by unscrewing of the lag screws securing it to wooden trough sides, thus facilitating cleaning and replacement.

● Speed Reducer

A new unit in the line of variable speed-control equipment built by Reeves Pulley Company, Columbus, Indiana, is the Reeves reducer-type transmission.

This drive, which consists of the standard Reeves variable speed transmission with built in speed reducer, has been developed to meet the many requirements for accurate speed control and speed reduction combined in one compact completely enclosed unit. An outstanding advantage of this drive is that far less mounting space is needed to obtain the lower range of speeds which formerly required the use of auxiliary speed reducing equipment.

The Reeves reducer-type transmission is available in two inclosed designs, horizontal and vertical, which may be mounted in any convenient or desired position. Each design is available in a wide range of speeds and in capacities from 1 to 7½ horsepower inclusive. The transmission in various sizes produces ratios of speed variation from 2:1 through 12:1 and the reduction gears provide ratios up to and including 6.9:1. Speed changes are effected by turning a handwheel or, if completely automatic regulation is desired, it is available by mechanical or hydraulic methods.

The transmission in either horizontal or vertical design may be equipped for individual motor drive by use of a special motor base. The motor mounting is directly above the transmission, the motor base being attached to the top of the transmission frame. This base is universally adjustable to accommodate any standard make of motor of the correct horsepower capacities for any given size of transmission. Connection between the motor and the constant-speed shaft may be either silent or roller chain and sprockets, multiple V-belts or pinion and gear.

New reducer-type transmission.

● Welding Shield

Development of a new eye-protection glass — Didymium-Noviweld — which allows eyes of gas welders to pierce blinding glare and see welding operations from beginning to end, thereby increasing production of welded equipment, is announced by the American Optical Company, Southbridge, Massachusetts. Previously, the glare of flame-welding made it impossible for welders to see exactly what they were doing.

Lenses made of the new glass possess all the ray-absorptive properties of Noviweld glass, plus the special characteristics of Didymium, a combination of elements with high absorption in that particular portion of the visible spectrum where "flux-flare" normally obstructs clear vision.

In all types of flame-welding, the new lenses cut down the high-intensity sodium rays of the fluxes. Flame workers can thus look right through the yellowish cloud of "flux-flare," see the rod and the molten area more clearly, and thereby step up their efficiency in every phase of the welding operation, particularly the

The Shiftograph is an instrument designed by the George S. May Company for use as a perpetual work-shift schedule. By simply turning a dial, the user can tell at a glance what shifts certain crews will work, the days they work, and their days off. This instrument provides for several different plans of rotation wherein all employees are treated alike, for they share equally in desirable and undesirable work shifts. More than 150,000 of these instruments are being distributed free of charge by the company as its contribution to America's war effort. This national firm of business engineers maintains executive offices in New York and Chicago, with branch offices in principal cities.

flame welding of aluminum and steel. The lenses also protect eyes by absorbing the harsh, tiring invisible ultra-violet and infra-red rays generated during welding.

RECENT PATENTS

Bulldozer. Thomas R. Paulsen, South Milwaukee, Wisconsin, assignor to Bucyrus-Erie Company. No. 2,308,535.

Rod screen. Loren G. Symons, Hollywood, California, assignor to Nordberg Manufacturing Company. No. 2,308,572.

Hammer-mill. Harold K. White and George A. Stephen, Chicago, assignors to Weber Brothers Metal Works, same place. No. 2,308,578.

Rock drill. Charles F. Osgood, Claremont, New Hampshire, assignor to Sullivan Machinery Company. No. 2,309,077.

Dry lime hydrate and process for producing. Bolton L. Corson, Chestnut Hill, Pennsylvania, assignor to G. & W. H. Corson, Inc., Plymouth Meeting, Pennsylvania. No. 2,309,168.

Conveyor-excavator. Joseph Harrington, Riverside, Illinois. No. 2,310,233.

Gyratory crusher. Harvey H. Rumpel, Milwaukee, Wisconsin, assignor to Smith Engineering Works. No. 2,310,601.

Excavator. Jesse O. Greer, Robert Lee, Texas. No. 2,310,735.

Shaftless cone crusher and tilting member therefor. Oscar C. Gruender, Milwaukee, Wisconsin, assignor to Nordberg Manufacturing Company. No. 2,310,737.

Impact member for impact crushers. Ewald Werner and Karl Steinhart, Milwaukee, Wisconsin, assignors to Nordberg Manufacturing Company. No. 2,310,758.

Method of increasing plasticity of Portland-cement mixtures. Robert B. Booth, Springdale, Connecticut, assignor to American Cyanamid Company (3 patents) Nos. 2,311,288, 2,311,389, and 2,311,290.

A carload of Amsco manganese-steel roll-crusher segments ready for shipment to construction projects on our "western front" where they are employed in the secondary reduction of rock for use on landing fields and access roads. Usually these segments are shipped separately, but to facilitate machining and truing up at the Los Angeles plant of the American Manganese Steel Division of The American Brake Shoe & Foundry Company, this lot had been "joined" together to form cylinders. This was done by means of ½-inch steel straps welded on. They were left that way to facilitate shipment. The "stevedores" had to handle only complete units instead of numerous individual segments. These straps are burned off with a welding torch when the rolls reach their destination.

Trade Literature

POWER AND DISTRIBUTION TRANSFORMERS. (Bulletin B6186). 20 pages. RO-FLO COMPRESSORS AND VACUUM PUMPS. . . (Bulletin B6211). 20 pages. Allis Chalmers Manufacturing Company, Milwaukee.

HOW TO LENGTHEN THE LIFE OF MECHANICAL RUBBER GOODS. 24 pages. Pioneer Rubber Mills, San Francisco.

TIME SAVER TO HELP KEEP WESTINGHOUSE LOCOMOTIVES ON THE JOB. 38 pages. Westinghouse Electric & Manufacturing Company, East Pittsburgh.

BELTING WISDOM . . . A READY REFERENCE FOR BELT USERS. 24 pages. Scandinavia Belting Company, Newark, New Jersey.

CAST TOOTH SPROCKETS FROM STOCK. (Bulletin 2067). 8 pages. Link-Belt Company, Chicago.

HOW ARE CATERPILLAR DIESELS SERVING AND SAVING? 8 pages. Caterpillar Tractor Company, Peoria, Illinois.

FILTER CLOTHS FOR INDUSTRIAL FILTRATION. 4 pages. William W. Stanley Company, Inc., New York City.

EQUIPMENT FOR ACCIDENT PREVENTION. (Catalog 50), 134 pages. Boyer-Campbell Company, Detroit.

CONCENCO SPRAY NOZZLES. (Folder) Deister Concentrator Company, Fort Wayne, Indiana.

VIBRO-INSULATORS. 12 pages. B. F. Goodrich Company, Akron, Ohio.

INDUSTRIAL HANDLING EQUIPMENT. 18 pages. Rose Manufacturing Company, Detroit.

SYNCHRONOUS-MOTOR CONTROL. (Bulletin 1724D). 12 pages. General Electric Company, Schenectady, New York.

FALK SPEED REDUCERS. (Bulletin 2100). 60 pages. Falk Corporation, Milwaukee.

TRADE NOTES

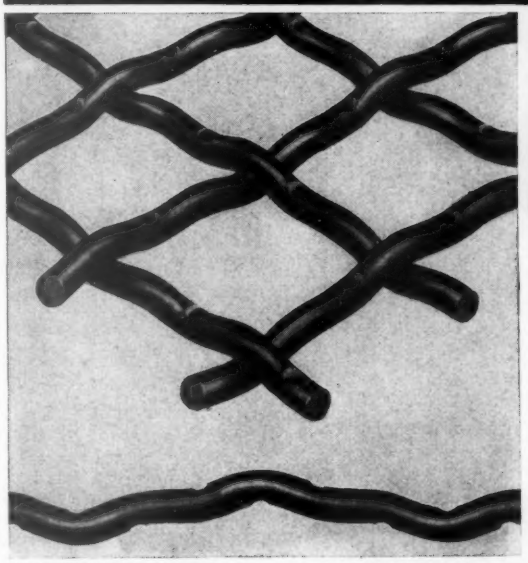
The Whiting Corporation, Harvey, Illinois, announces that the headquarters of its Canadian subsidiary, Whiting Corporation (Canada) Ltd. has been moved to 45 Richmond Street, West, Toronto, where its newly elected vice-president and general manager, H. M. Rowlette will be in active charge of the Canadian business. He succeeds Col. James Mess, now devoting full time to government duties at Ottawa.

District representatives, factory engineers and production executives of the Euclid Road Machinery Company recently convened at Cleveland to discuss field service problems, new product developments and design improvements for the post war period.

At the conference, E. F. Armington, general sales manager, announced that Virgil L. Snow, assistant chief engineer had been assigned to new duties in the industrial field. In his new capacity Mr. Snow will work with mining companies, quarries and other industrial concerns in the application, design and maintenance of Euclid equipment.

Assuring ✓ Many extra hours of service ✓ Toughest resistance to wear

BUFF-ALOY ABRASIVE RESISTANT WIRE CLOTH



Production records prove conclusively that BUFF-ALOY is most economical and dependable for sizing stone, gravel, sand and all mineral aggregates.

These qualities alone distinguish it from ordinary steel and other special metals:

Annealed and normalized for maximum uniformity • High torsion at great strength • Greater fatigue coefficient • Properly controlled crimping prevents weak spots and damage to core.

Available in all standard weaves and sizes (special sizes are manufactured to order).

NEW CATALOG No. 12-BE
Full information on BUFF-ALOY. Also data and formulas vital to your industry.

DOING BUSINESS FROM COAST TO COAST FOR 74 YEARS

Buffalo WIRE WORKS CO., INC.
ESTABLISHED 1869 AS SCHEELER'S SONS

526 TERRACE BUFFALO, N.Y.

PMCO WELDED DIPPERS IN LARGE SIZES

meet the requirements in coal stripping mines

12½ YARD PMCO WELDED DIPPER

Efficient weight factor gives greater capacity to the shovel

● "Welding has met the requirements and has become the authorized and recognized method of fabrication." This statement by a prominent military engineer is just as true in making power shovel dippers as in making war tanks and gun carriages. Modern welding methods are employed by Pettibone Mulliken engineers to build dippers of maximum strength and efficiency.

We operate the largest and most complete manganese steel foundry in the United States.

PETTIBONE MULLIKEN CORPORATION

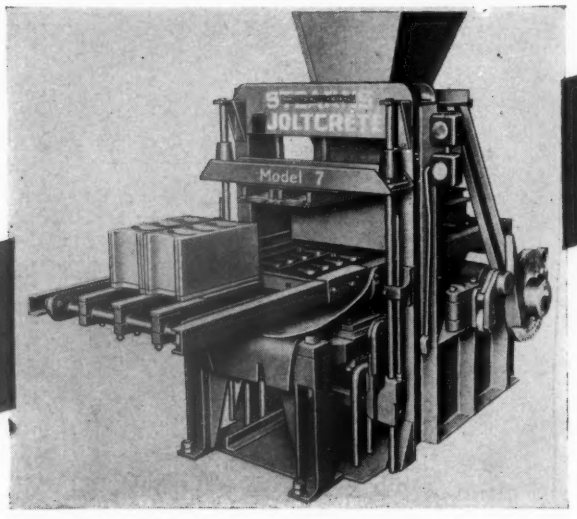
Established 1880

4710 West Division Street, Chicago, Illinois

April, 1943

The CONCRETE MANUFACTURER

A Special Section of ...



Stearns Joltcrete No. 7 — makes six 8x8x16-in. concrete blocks per minute—handles all types of aggregate with equal facility.

Stearns Joltcrete

serves in War as well as in Peace

The Stearns plant, normally devoted exclusively to the manufacture of concrete products plant equipment, is now running 24 hours a day, seven days a week, making tank parts, other armament items and concrete machinery for war purposes.

Stearns Concrete Machinery Is Still Available

If required for producing masonry units for authorized building jobs, we can supply Vibration and Tamp Type Block and Brick Machines, Mixers, and Skip Loaders. We are making such shipments, not only to domestic points, but also to those United Nations needing these machines for prosecution of the war effort.

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

Licensed under the basic Gelbman vibration patents.

The CONCRETE MANUFACTURER

APRIL, 1943

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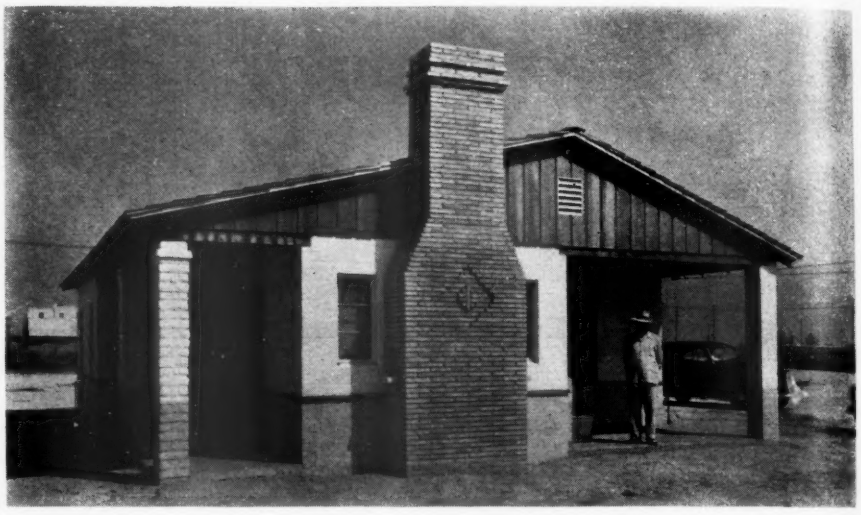
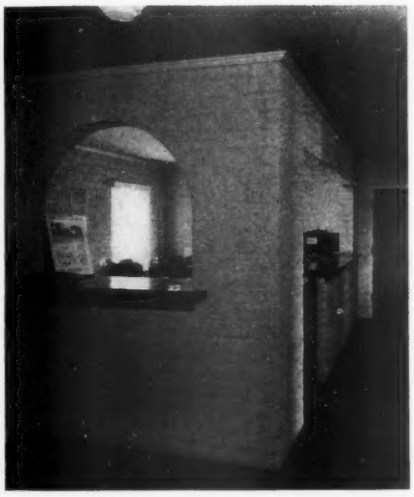


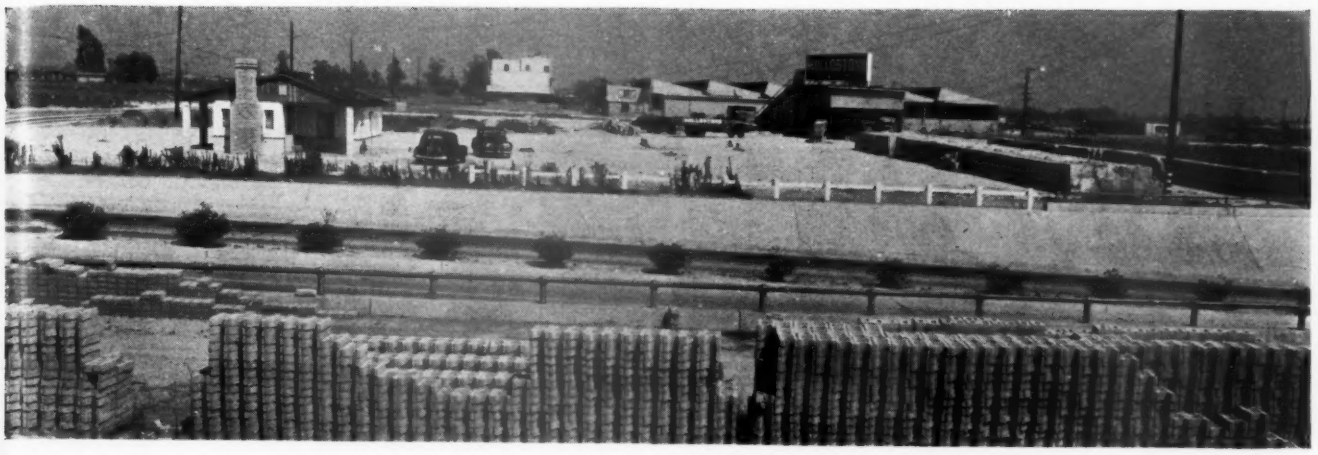
M. L. White standing in the doorway of the model house which serves as office and laboratory for his Hollostone concrete-tile plant. (See story at right.)



The customer's side of the room which is used as the general office.

Mr. White's private office in the "living room" of the house.

A view from inside the room used as the general office. At the left is a 12-foot-span beam and at right an archway, both of which are also shown at the left above.



This view of the new Hollostone Company office and plant was taken across Lankershim Avenue from the old plant with some of its storage yard in foreground.

New Tile Plant Across Road from Old Reflects Progressive Spirit of Owner

another ON THE SPOT report

By W. E. TRAUFFER

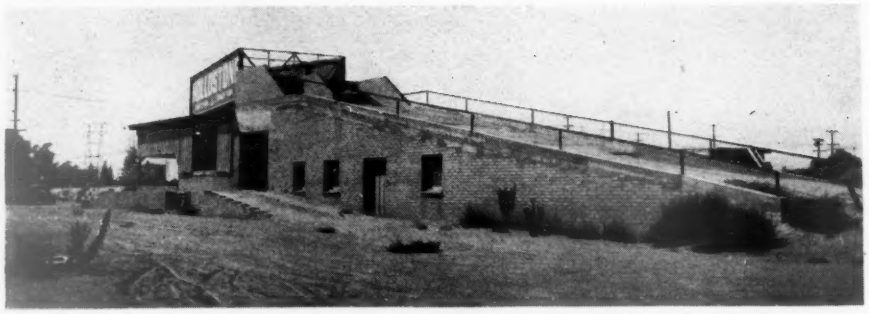
A FEW concrete - products manufacturers ever realize what must be to most of them a major ambition, the construction of a new plant embodying all the features they would consider necessary in an ideal plant. For M. L. White, owner of the Hollostone Company, North Hollywood, California, this ambition was realized in August, 1941, when he put in operation an entirely new plant across a highway from the plant he had operated since 1925. The design of this plant was evolved over a period of years and its construction was completed without the usual pressure of time, as it was built while the old plant was still in operation. It is located on a 5-acre property owned by Mr. White at 7150 Lankershim Avenue, one of the major outlets to the north from the Los Angeles metropolitan area. The old plant is on 2 acres of leased land and the storage space was sometimes inadequate.

In the new plant office building Mr. White fulfilled his desire for a structure which would not only serve this purpose but which would also be an advertisement for the company's products. This building is actually an attractive house, with 5 rooms and bath, adapted to combined use as an office and display room. The walls are built of 4- by 8- by 12-inch concrete-masonry units, exposed inside and out, and reinforced to conform with local building regulations. These are painted shades of light and dark tan on the outside and the interior of each room is painted in a different color of cement paint. The room which serves as the general office demonstrates the use of these units in an archway and in a 12-foot-span beam. The latter consists of four courses of blocks which are reinforced and filled with concrete. Another room used by Mr. White as his private office has a wood-burning fireplace of simulated flagstone construction and a ceiling of exposed roof timbers. The other rooms, one of which is used as a laboratory, illustrate other effects which can be obtained with this type of construction. The building has a concrete floor covered with asphalt linoleum.

One of the conveyor carts shown in use at the old tile plant.

The demand for Hollostone blocks, or tiles as they are known on the West Coast, and for concrete units generally had been growing consistently in recent years. In the Los Angeles metropolitan area alone over 5,000,000 units were sold in 1941 and prospects were bright for an even better year in 1942. This growing demand was what prompted Mr. White to go ahead with the construction of the new plant in order to supplement the capacity of the old one with its two machines, which could not keep up with orders. The new plant was built with space for two machines, but one of these has since been removed. These four machines were kept busy until our entry into the war, when the demand dropped off to a point where one machine in the new plant was able to meet the demand. Some war work has been obtained and more is expected. The old plant is temporarily shut down but when the demand again increases it will be used for making specials and a second machine will again be installed in the new plant.

An article in the May, 1938, issue of PIT AND QUARRY described the Hollostone block machine then in use and the history of its development by Mr. White. The improvements made since that time are combined in the machine in the new plant. None of these are of a radical nature and consist mainly of refinements in its structural design and changes in the speed and amplitude of vibration. It is now built almost



View of the new tile plant with ramp for aggregate trucks in foreground. Specialties are made in room under ramp.

entirely of structural steel with only a few castings and weighs almost one-third less than earlier models which, with molds and motors, weighed about 1,500 pounds each. The present machine makes better blocks which are affected less by variations in the concrete mixture. Its capacity remains about 120 square feet of 8-inch wall per hour with a two-man crew.

Forty different sizes of blocks or tiles can be made on this machine on a single plain wooden pallet. The 4- by 8- by 12-inch unit is by far the most popular and 4- by 4-, 4- by 6- and 4- by 12- by 12-inch units are also popular. There has also been a fair demand for slump tiles, which are used for special architectural effects.

The aggregates used in this plant are received in trucks from local sources and are discharged from a ramp, at an elevation of 17 feet, into two 30-ton bins. This ramp is wide enough for two trucks to pass and has concrete-block retaining walls with concrete curbs and steel railings. Under the highest section of the ramp is a room in which special products are now being made. The 12-inch reinforced-concrete slab floor of the ramp serves as the roof of this room.

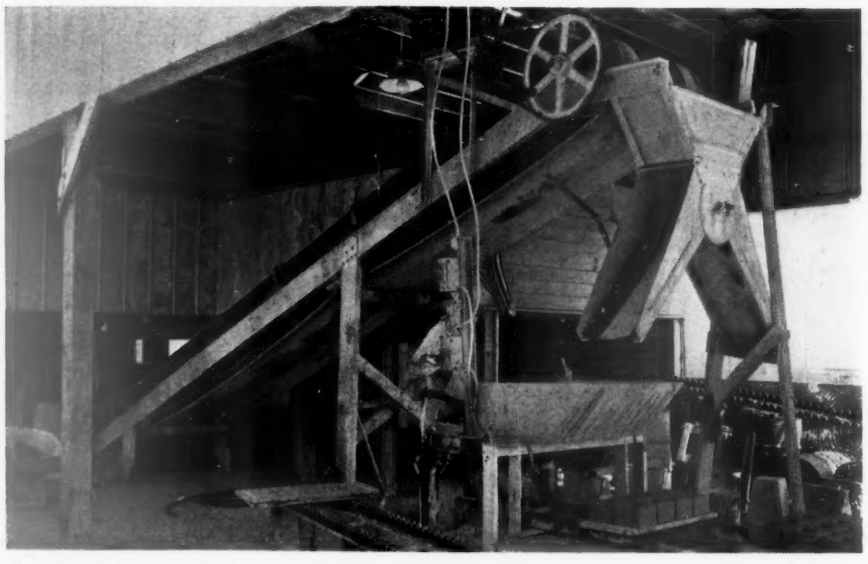
The cement used in this plant is received in sacks. A truck-load of cement is backed up a low ramp so that its body is on a level with what might be called the batching floor. There the sand and pea gravel are discharged into a volume-measuring box. The cement is dumped into a spout which joins the chute from the measuring box just above the point where it discharges into the 21-cubic foot T. L. Smith mixer. Water is measured into the mixer from an automatic volume-measuring tank.

Plaster plaques and novelties being made in room under ramp.

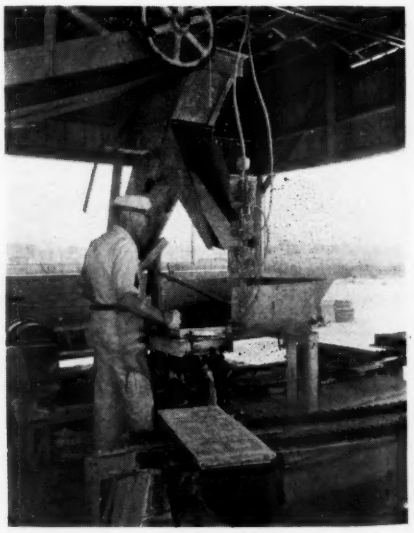
The concrete is discharged from the mixer on a 36-inch by 25-foot Link-Belt inclined belt-conveyor which holds a batch of concrete and serves as a reserve hopper for the block machine. This conveyor is filled by the mixer operator who starts it when it is empty and discharges a batch on it from the mixer. The machine operator then starts and stops the conveyor as necessary to keep the small machine hopper full. When a second machine is installed, similar controls will be installed for it. A split chute is already installed for the second machine and its gate lever is within easy reach of the machine operator. This system gives the machine operator absolute control over the concrete and gives him the exact amount of concrete he needs at any time.

The use of this conveyor is made possible by the fact that a no-slump concrete mixture is made. Fifty-four of the 4- by 8- by 12-inch blocks are obtained per sack of cement used. The blocks are said to have an average strength of 2,500 p.s.i. with an absorption of 4 to 5 per cent., compared to a city-specified maximum of 8 per cent.

The blocks are discharged from the machine on wooden pallets on a gravity roller-conveyor. Each pallet holds four 6-inch or three 8-inch-deep tiles or other sizes in proportion. The blocks are carried to storage on conveyor carts designed by Mr. White which have been used successfully for several years. Each cart consists essentially of a roller-conveyor on a steel framework with pneumatic-tired pivoted axles at



The tile machine with storage conveyor which feeds concrete in desired quantities from mixer at left.



Another view of the tile machine showing tile and pallet conveyors.

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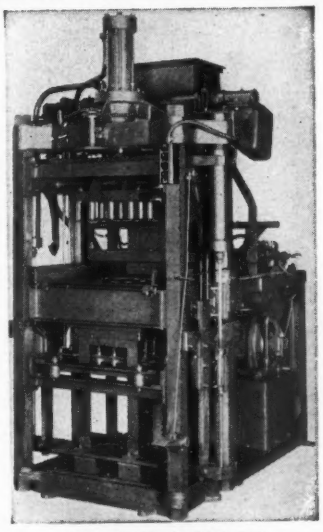

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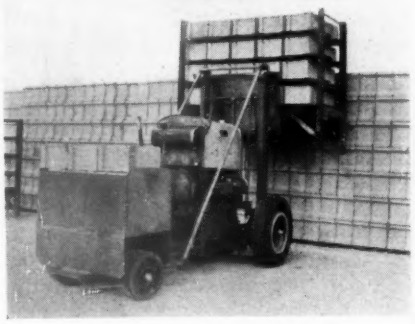
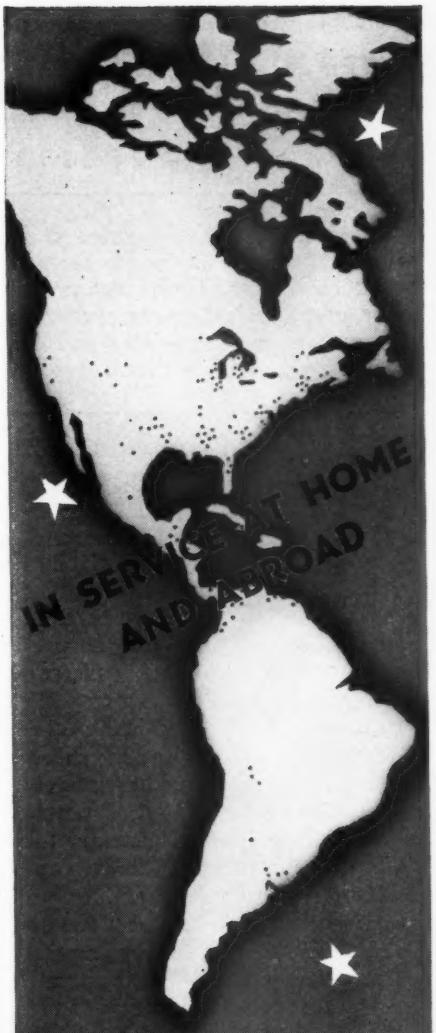
each end. At each end of the cart is a tubular steel handle which is connected by rods to the axle at its end. The two axles are also connected by cross rods. The operator can push this cart from either end and steers it by turning the handle. The cross lever arrangement turns the two axles in opposite directions making it possible to maneuver the long cart around sharp corners and through unbelievably narrow spaces. With these carts one man can easily move a ¾-ton load of blocks to storage and two men can haul and store in the yard 3,600 units in 10 hours. Each cart, according to Mr. White, saves one man's time.

The first cart made held 17 pallets and the latest holds 22. One end of the cart is pushed against the end of the machine conveyor for loading and the laden pallets are pushed on it. In the yard the blocks are removed to piles on their pallets and then covered with old burlap bags. The bags are then kept soaked and this, with the hot sunshine with which Southern California is blessed for the greater part of the year, effectively cures the blocks. The mixer operator at present finds time to store the blocks in the yard between mixes with one of these trucks.

Early in 1942 Mr. White added a sideline which has become of considerable importance. The shortage of metal for novelties opened a tremendous market for plaster plaques and similar objects. These are being made under contract in the room under the ramp which has been mentioned. After being cured out of doors these plaques are painted various colors and they are used as premiums by soap companies, distributed to souvenir dealers, etc.



This power lift-truck was developed especially for concrete-products plants by a former concrete-products manufacturer. It is said to have the stamina, power, speed and flexibility needed for that particular job. It is of all-steel, all-welded construction and has a fast hydraulic platform raiser equipped with automatic relief valve. An electric light with handy dash switch illuminates the darkest curing room. The Erickson Special Equipment Company, Minneapolis, is the manufacturer.



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Tips on Maintenance for Ready-Mix Operators--I

● This is the first of a series of articles devoted to maintenance suggestions for equipment used in the production of ready-mixed concrete. The first installment covers aggregate bins, cement bins and weighing batchers for aggregates, cement and water. Subsequent articles will deal with conveyors for aggregates and cement, clam-shell buckets, truck-mixers, agitators and truck chassis.

By ARTHUR A. LEVISON
Manager, Construction Equipment,
Blaw-Knox Division, Blaw-Knox Company

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READY-MIXED concrete has been adopted in practically all sections of the country and one rarely encounters a city where it is not available. No estimate is available of the total amount of money invested in the equipment used for the production of ready-mixed concrete, but it is reasonable to assume that it runs well over $100,000,000.

The war and its attendant shortages of critical materials has severely restricted the availability of nearly all kinds of equipment necessary for the production of ready-mixed concrete. It is pertinent, therefore, to take stock of what can be done to prolong the life of existing equipment and keep it in efficient operating condition for the duration of the war.

The same line of reasoning applies to practically all construction equipment. However, the ready-mixed-concrete industry is a highly specialized one and the types of equipment required for its operation are relatively few. The problems involved in their proper maintenance are not complex; actually they are relatively simple. Proper maintenance involves some planning or system, a little foresight, some extra attention and care to the daily use and treatment of the equipment.

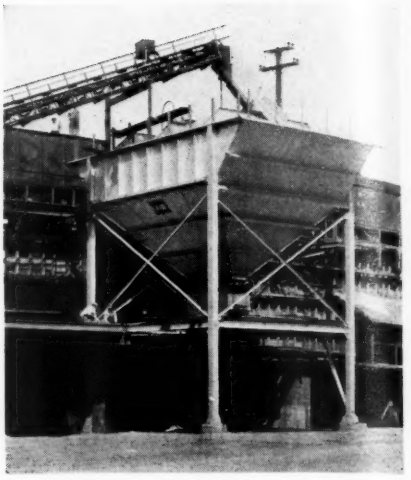
Even with the severe restrictions and limitations imposed by the War Production Board on the acquisition of new equipment by the ready-mixed-concrete industry, it is most fortunate that the restrictions imposed on the acquisition of repair parts are relatively light and easily met by all operators. Manufacturers of the various types of ready-mixed-concrete equipment are, in practically all instances, cognizant of their responsibility to the users of their equipment with regard to supplying them with adequate repair parts so that use of the equipment may continue uninterrupted.

This series of articles will cover the items commonly included in plant set-ups for the production of ready-mixed concrete, such as the bins and batching equipment for aggregates, cement and water; conveying equipment for aggregates and cement; clam-shell buckets; truck-mixers and agitators; and, to a limited extent, the truck chassis on which the mixers and agitators are mounted. Machinery such as cranes for the handling of materials, stationary concrete mixers, boiler-houses, etc., which are not common to the majority of ready-mixed plants, have been omitted as it is felt that the best information on the maintenance of these items can be obtained from the manufacturers involved.

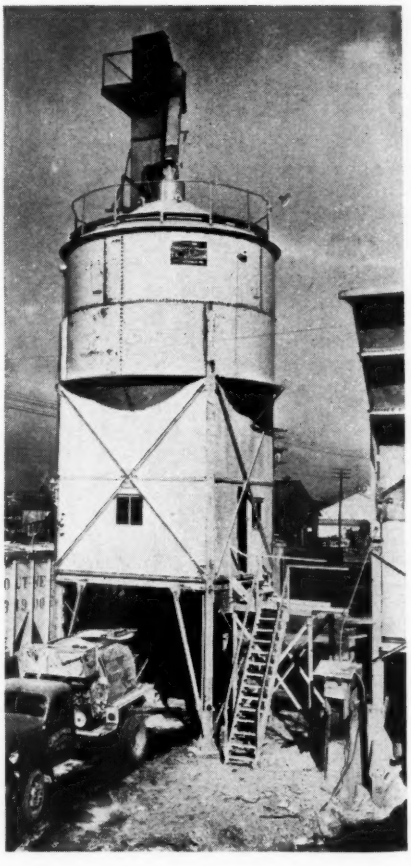
Aggregates Bins Overhead storage bins for aggregates require very little attention. It is fundamental that all bolts should be tight, and that all missing bolts should be replaced. All bent structural members, either in the interior of the bin, or in the framing and substructure which support the storage bin, should be straightened. This usually requires the removal of the member from the bin, straightening it and then replacing it.

The interior of the bin compartments should be periodically cleaned out to remove any accumulation of material that does not flow out by gravity, especially hardened or encrusted masses of aggregate. Never paint the interior of the bin compartments as a maintenance measure. It is unnecessary, and the flow of material on the bin slopes will be impeded by a coat of paint. The exterior of the bin, bin supports, and bracing should be kept painted as a protective measure and to enhance the appearance of the plant. Normally, this repainting need not be done more often than once a year.

The settlement of bin foundations is not an uncommon occurrence. This can be readily checked by ac-



A 400-ton four-compartment aggregate bin and weighing batcher for loading truck-mixers. Large overhead bin required in this installation because hopper-bottom gondola cars are unloaded by means of inclined belt-conveyor and cars must be emptied and released.



Bulk-cement plant installed to eliminate handling of cement in bags. Cement elevator unloads cement from hopper-bottom cars and an inclosed revolving turnhead chute distributes cement into any one of three bin compartments. Electric bin signals near top of vertical bin walls give audible signal when compartments are full.

curate leveling between the base plates of the bin columns. Where settlement has occurred, it should be corrected, because uneven settlement of the bin foundations will cause stresses in the bin members, which were not taken into account in the design of the bin structure.

The building of extensions on existing bins to increase their capacity involves a considerable amount of risk. It should never be done unless the manufacturer who furnished the bin will sanction this overloading.

If the aggregate-storage bins include provision for thawing and heating the aggregate with live steam, the steam jets and piping should be dismantled and cleaned each year.

Steel plates that have worn thin in the bin hopper or bin sides should be replaced by new plates. This can be accomplished most economically by burning out the plate to be replaced with a torch, and welding the new plate in place. Plants that use cranes and clam-shells for loading the aggregates into the overhead bins will frequently find the bin partition extensions bent and damaged from having been bumped by the clam-shell buckets. Usually these partition extensions can be straightened and the addition of a timber bumper block will minimize future damage. Under similar circumstances a timber bumper block around the rim of the bin at the top will serve the same purpose.

No remodeling of a steel bin and its substructure, including the bracing, should be attempted without consulting the manufacturer of the bin or a competent structural designer.

Cement Bins Nearly all bulk-cement bins are equipped with steel roofs to protect the interior of the bins and their contents. Most of the recommendations given above for steel aggregate bins apply with equal force to bulk-cement bins except, of course, the references to loading the bins with clam-shell buckets. Practically all cement bins are filled by means of conveyors or air systems of some type.

The joints in the cement bin should be checked for weather tightness. A man inside the storage-bin compartment can easily detect any points of leakage or places where the weather can enter the bin because such parts will let daylight enter the bin also. The cheapest way to seal a leak is to use plastic roofing cement. This material does not get hard under low-temperature conditions and will not flow under high temperatures.

A steel bin for the storage of bulk cement should be emptied and cleaned more frequently than an aggregate-storage bin. Cement may include some moisture when it enters the bin, and hardened lumps of cement will develop in spite of all precautions. These should be removed, including any hardened cement that adheres to the bin sides. Cleaning down the inside of the cement-bin compartment with a wire brush when the bin is emptied for inspection and the removal of hardened cement is good practice. Never paint the interior of a cement bin. It will cause the cement to "hang up" in the bin and seriously retard its flow.

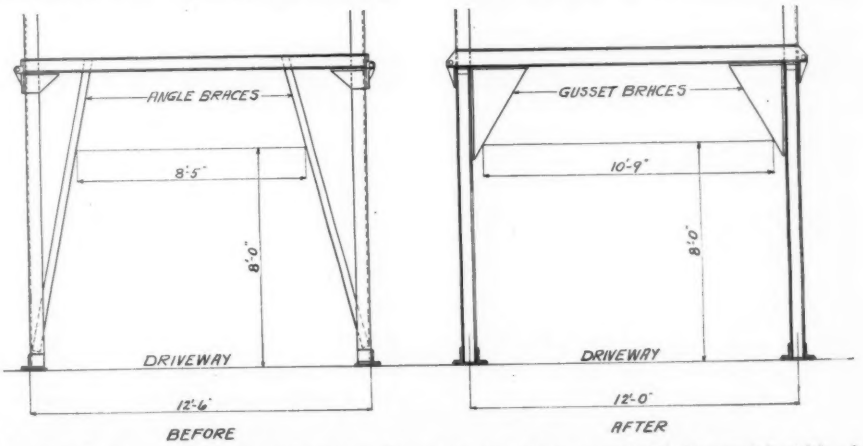
Most modern bulk-cement bins include air piping and air jets for aerating the cement to break up clogging and arching. It will be found in most cases that lumps of hardened cement collect around the air jets in the interior of the bin. These should be removed and the air jets should be cleaned.

Some users of cement bins prefer to use electric vibrators above the bin's discharge gate to assist the flow of cement from the bin. The most frequent repair parts for these electric vibrators are commonly called diaphragms. The manufacturer of the vibrators uses the term "anvil plate and fibre disk" instead of diaphragms. One set of this material for each electric vibrator should be kept on hand as an emergency repair.

The full-bin indicater commonly used on cement bins also requires periodic inspection. The chief difficulty encountered is that the flexible canvas diaphragm which causes the bell signal to operate due to the pressure of cement when the bin is full, becomes stiff as a result of moisture coming in with the cement or through leaks in the bin. When the canvas diaphragm becomes encrusted with cement, the bell signal will fail to operate. This may lead to serious difficulty with the bucket-elevator that fills the overhead cement bin. The elevator will continue to operate and the cement will back up from the bin into the elevator and cause a serious breakdown of the elevator equipment. If there is any suspicion at all that the full-bin signal is out of order, a careful watch should be maintained by sending a man up to the top of the bin where he can inspect the amount of cement in the bin through the manhole in the bin roof. Failure of the full-bin signal to operate has been the cause of conveyor breakdowns in quite a number of plants. Replace the encrusted canvas diaphragm with a new one and inspect the mercoid switch to see that it is operating freely, also that the wired connections are in place.

Bin Driveways The condition of the driveways beneath truck-mixer loading plants has considerable bearing on the speed of operation and the volume of production. Many ready-mixed-concrete plants have been installed with the utilization of aggregate-batching plants and bulk-cement plants of the more popular portable or semi-portable type. These plants are easy and economical to erect and can be dismantled and moved to another location with little expenditure. However, the width of the driveway in these types of plants is often restricted so that careful maneuvering is required on the part of the truck-mixer driver to avoid collision between the truck and members of the bin sub-structure.

The width-of-driveway condition can be improved in some instances by changes in the bin bracing as indicated in the accompanying sketch. The advice of the bin manufacturer or a competent structural designer should always be obtained in mak-



By substituting gusset braces (right) for the original angle braces (left) the useful width of the driveway can be increased.

ing such a change. On some plants bracing members have been removed by the user to help the driveway lateral clearance condition. This is dangerous and should not be done.

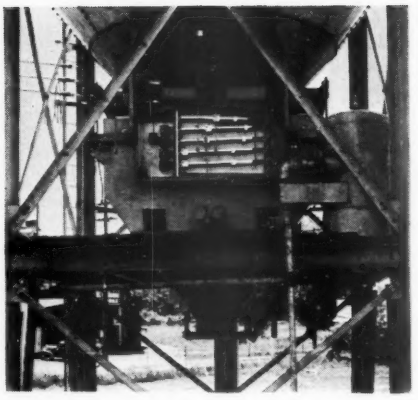
Another method of expediting the movement of trucks beneath the charging plant is to install curbings of either concrete or timber where conditions make this possible. This expedient provides a guide for the truck wheels as the forward end of the truck chassis passes beneath the charging bin and at the same time prevents possible collision between the truck and the bin column or bracing. Where bin braces have been bent, they should immediately be removed, straightened and then put back in place.

Some plants have depressed driveways in order to provide sufficient vertical clearance for the truck-mixer beneath the batchers or loading chute. In most cases depressed driveways offer definite operating objections. They form a sump and collect drainage water which is difficult to remove without pumping.

Depressed driveways create a sharp upgrade for the truck to climb after receiving its load. Both conditions are undesirable. Where it is feasible, the plant should be raised so as to eliminate a depressed driveway. This may involve the addition of a section of elevator for loading the aggregates or cement into the bin, or it may be solved by operating the crawler crane on a slight embankment of aggregates so as to give it the necessary reach for handling the extra height of the overhead storage bin.

The driveway should be kept clear of aggregates and cement that spill over the sides of the truck when the mixers or agitators are being loaded. These materials build up in the driveway and gradually decrease the vertical clearance available.

Many truck-mixer loading plants are so arranged that aggregates, cement, and water are charged into the truck-mixer at one place and by one man. This is most desirable from the standpoint of speed of operation and production. Many other plants have separate plants, one for aggregates and one for cement, with two charging positions for the trucks. This requires two men for operating the batching equipment and loading the truck with the delays incurred by this two-stop system. Where the cement and aggregate bins are close enough together, the cement-weighing batcher and its scales can be moved over adjacent to the aggregate-weighing batcher and, by means of an electrically operated screw-



Composite type 2-cubic yard weighing batcher for aggregates and cement. Batcher accommodates four classes of aggregates and has 15-inch discharge opening which empties into truck-mixers without use of funnel or confining hopper.

feeder for the cement, the plant can be converted into a one-man-operated, one-stop plant. A number of these conversions have been made with excellent results. For a moderate extra cost the screw-feeder for the cement can be made automatic in its operation, thus insuring greater accuracy of cement measurement than is possible with manual control.

Aggregate-Weighing Batchers The bin gates, weighing hopper and discharge gate on the weighing hopper, including all the levers for operating the gates, should be checked for wear and corrosion. The bin gates which control the flow of material from the overhead storage bin into the weighing hopper are subjected to the most severe wear due to the abrasion of the aggregates, and corrosion due to moisture gravitating to the bottom of the bin. The replacement of worn or corroded parts should be made when necessary.

The most critical parts of the weighing batcher are the weighing scales and scale members. Essential suggestions for the care and maintenance of the scales are:

Maintenance of the scale mechanism requires, principally, that all the vital parts be kept clean and that all the check nuts be kept securely tight so that the scale adjustment does not get out of order.

Obstructions should not be allowed to accumulate in the bottom of the scale-beam box because they might get beneath the shelf lever and seriously interfere with the scale's operation and accuracy.

All knife edges and shackles should be kept clean and properly centered to prevent binding in the scale. Periodic inspection should be made to make sure that no part of the scale or the weighing hoppers or their discharge gates is touching any fixed object about the plant. Also, attachments to the weighing hopper or its appurtenances, such as cables, chains, electric wiring, etc., leading over to some fixed point will provide a drag on the scale mechanism which will interfere with its accuracy of operation.

After a long period of use if the scale becomes sluggish in its operation, examine the knife edges. When the knife edges have become dulled they should either be replaced or field repairs may be made by removing the knife edges and having them honed.

The scales should at all times be maintained in a horizontal and plumb position. Watch for settlement of the bin supports or foundations, because settlement will throw the scale mechanism out of horizontal and plumb. Any settlement detected should be corrected.

The indicator mounted on the top of the scale-beam box should be kept level at all times and the glass window cleaned so that the indicator pointer and the zero mark will always be visible to the operator.

Under conditions of extreme temperature changes it may be necessary to change the consistency of the oil in the dashpot, or to adjust the piston that operates in the dashpot, so as to vary the resistance as it moves up-and-down in the bath of oil. Generally, in extremely hot temperatures, a small amount of SAE No. 10 oil added to the kerosene in the dashpot will aid the dampening action of the scale and thus hasten the weighing operation. Under extremely low temperature conditions only kerosene oil should be used in the dashpot.

The scales should be checked with accurate test weights at the beginning of the plant operations and periodically thereafter to make sure that the accuracy of the scales is within the limits of the required tolerances. This is an important point in the use of weight-proportioning equipment, and the ready-mixed-concrete manufacturer should be sure of the accuracy of his scales for his own protection.

The gear segments of the gates at the bottom of the bin, also those of the discharge gate at the bottom of the weighing batcher, should be greased occasionally. The pin connections for the levers for the filling gates and discharge gate should be lubricated with SAE No. 50 oil.

A few drops of machine oil should be applied occasionally to the poise-release pin of the scale-beam poises; also, a few drops of machine oil should be applied to the trig locks.

The oil in the dashpot should be kept clean. A small amount of machine oil should be applied occasionally to the various threaded adjustable connections of the scales, such as the hook bolts, U-bolts, etc., to keep the threads from rusting and so that adjustment can be quickly made when necessary. The faces of the graduated reading beams should be wiped with machine oil occasionally to prevent rusting.

No lubrication is required inside the scale indicator housing. Do not oil or grease any of the knife edges or shackles of the weighing scales, and this will avoid any accumulation of sediment or dust which tends to make the scales sluggish in their operation.

When springless dial scales are used instead of beam scales, adjustments in the springless dial head can best be handled by a scale-factory service man.

Unless a watchman is employed at the plant site, locking the cover on the scale-beam box may help to prevent the loss of brass parts through theft.

In general, there are two types of weighing hoppers for aggregate batchers; the type with a wide discharge which is more suitable for loading batch trucks, and the type which has a circular discharge opening approximately 15 to 18 inches in diameter for loading truck-mixers. In some plants the wide-discharge type of batcher has been adapted for truck-mixer loading by the use of a confining hopper or funnel. The wide-discharge type of weighing hopper can be converted to the confined type, thus eliminating the use of a confining hopper and saving some headroom. This can be accomplished by burning off the lower portion of the weighing hopper including the discharge gate and welding on a new lower section of the weighing hopper including the discharge gate of the confined type.

Weighing hoppers should be repainted occasionally as required but on the outside only; the inside of the weighing hopper should never be painted. The interior of aggregate-weighing hoppers usually acquires considerable polish through continued use.

Checking Weighing Scales The following procedure is a step-by-step method of checking weighing scales with test weights.

1. Make sure that all horizontal scale members are level and all vertical members are plumb.

2. Assuming that the scale beam to be tested has three weighing beams and an indicator, set all three poises on the three weighing beams at zero. The capacity of the scale or the number of beams will not affect the procedure as described herein.

3. Adjust the indicator so that the pointer has approximately 1 inch of travel past the zero point when the main (upper) beam is at the top of the trig loop. This is done by adjusting the turnbuckle which connects the indicator to the butt of the main beam.

4. Release the main beam. Add or subtract the counterweight in the counterweight pot hanging at the butt end of the upper beam until the indicator pointer balances at zero. During this operation the two lower auxiliary reading beams should be locked out of play.

5. Move the upper beam up and down to see that it works freely and that the indicator pointer moves back and forth and stops at zero. If the indicator pointer does not stop at zero, look for friction in the scale. One of the first places to look is the indicator and indicator dashpot.

6. Release the upper auxiliary beam with its poise set at zero. Adjust the counterweight at the butt end of this beam by sliding it back and forth until the indicator pointer again returns to zero.

7. Release the second auxiliary reading beam with the poise at zero. Adjust the counterweight at the butt end of this beam by sliding it back and forth until the indicator pointer again returns to zero. This latter operation will make the indicator pointer come to zero with all three reading beams in play and with their poises set at zero.

8. Lock the two auxiliary beams out of play.

9. Move the poise on the main beam to the 100-pound graduation. Place two 50-pound test weights, one on each side of the weighing batcher. The indicator pointer should come to zero.

10. Move the poise on the main beam to zero. Move the poise on the first auxiliary beam to 100 pounds and release the first auxiliary beam. The indicator should again come to zero.

11. Move the poise on the first auxiliary beam to zero. Move the poise on the second auxiliary beam to the 100-pound graduation and release the second auxiliary beam. The indicator pointer should again come to zero.

12. Lock the two auxiliary beams out of play and move the poise on the main beam to the 200-pound graduation. Place two more 50-pound test weights, one on each side of the weighing batcher. The indicator pointer should come to zero.

13. Repeat steps 10 and 11 for the two auxiliary beams.

14. Repeat steps 10, 11 and 12 by increments of 100 pounds until 500 pounds of test weights have been added to the batcher and all three reading beams are tested.

15. Remove all the test weights from the batcher and with the poise at 500 pounds on the main beam, and the two auxiliary beams locked out of play, admit material slowly and carefully to the weighing batcher from the overhead bin until the indicator pointer comes to zero. Then check the two auxiliary reading beams in accordance with steps 10 and 11.

16. Then repeat the entire series of check tests by increments of 100 pounds with the test weights until the 500 pounds of test weights have been added to the weighing batcher and poise is set at 1,000 pounds.

17. Continue the repetition of the series of tests up to the full capacity of the weighing batcher, if desired.

Errors in Weighing Scales The principal causes for errors in weighing scales are:

1. Friction in scale system. Check especially the dashpot in the indicator and the connection to the butt of the main beam for possible friction.

2. Physical contact of the weighing hopper or its appurtenances with some fixed object.

3. Non-uniformity of the graduation notches in the reading beam.

4. Worn knife edges.

5. Accumulation of dust or grease around knife edges or loops.

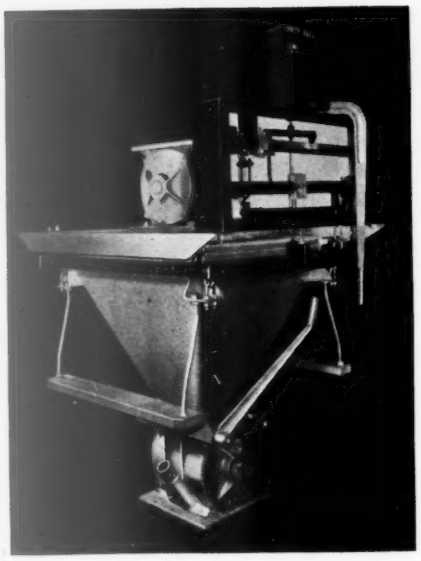
6. The scale may be out of multiple which will require readjustment of the nose iron.

7. The scale may be magnetized, in which case the main beam will stick to the lower part of the trig loop and let go suddenly when the load in the weighing hopper goes well beyond the weight for which the poise is set on the beam.

8. Check the tightness of all the jam nuts.

9. Check the nose shackle where the connecting arms meet. There may be friction at this point, or one connecting arm may be touching the other.

Cement-Weighing Batchers All the suggestions given for the care and maintenance of the scale equipment for aggregate-weighing batchers apply with equal force to cement-weighing batchers. Greater attention is needed



Standard 2-beam cement-weighting batcher with manual filling and discharge valves. Note suspended platforms for checking scales with test weights.

with cement scales for keeping them clean because of the rapid accumulation of cement dust. Also, due to the nature of the material being handled, a close watch should be kept of the condition of the interior of the cement-weighing hopper so as not to allow any continual adherence of cement or accumulation of hardened cement in the hopper. If a cement-weighing hopper does not discharge freely and cement is continually hanging up, rubbing down the inside of the hopper with emery will prove advantageous.

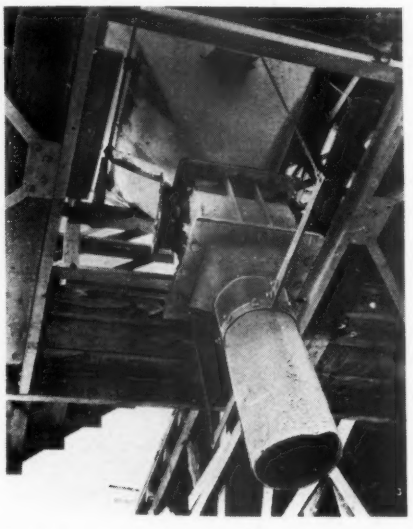
Both the filling and discharge valves for the cement-weighing unit should be periodically dismantled, taken apart and cleaned. No lubricant should be used in the interior of cement valves or gates because it combines with the cement to form a gummy compound. Most modern weighing batchers include an emergency slide gate above the filling valves so that the valve can be removed even though the storage bin contains cement. The cement valves should be checked for wear, and replacement of worn parts should be made when excessive wear is apparent.

An extra flexible canvas dust cover should be kept on hand at all times. The dust cover is the canvas shroud which seals the space between the top of the weighing hopper and the bottom of the filling gate. These dust covers have a limited life and when they tear or develop leaks, excessive cement dusting around the plant will occur.

Some of the modern filling valves for cement include an opening for an air vent. To this opening there should be attached a 3-inch diameter vent pipe—downspout pipe is satisfactory—and this pipe should be led away from the operator's position to a location where the discharge of air and cement from the vent will not be objectionable. The venting of the cement-weighing batcher is important. As the batcher fills with cement the cement displaces air and it is essential that a clear outlet be provided for the air to allow it to escape quickly. If the filling valve does not include a vent opening, then the vent can be attached to the flexible dust cover.

Many of the discharge chutes are made of canvas and these wear out in a relatively short time. If canvas discharge chutes are used, an extra one should be kept on hand. A better material for the discharge chute is a rubber-impregnated fabric like that shown in the illustration. The photograph illustrates a telescopic discharge chute the controls for which are convenient to the batcher operator. This telescopic chute has a range of vertical adjustment which accommodates various heights of truck-mixers and thus prevents loss and dusting of cement.

Because of the high cost of cement compared to that of the other ingredients of concrete, the testing of cement scales should be done regularly and with extreme care. There is a case on record where the local sealer of weights and measures approved a cement scale without checking it for accuracy. The error in measurement of cement was not detected until 10,000 cubic yards of concrete had been shipped. A situation of this type can lead to aggravated difficulties. Ten 50-pound test weights, which cost about $50, will test all the scales at any mixing or truck-mixer loading plant. The procedure of testing the scales once learned is not at all complicated. The owner of the plant should see to it that the cement scales are tested not less than once a week and more often when possible.



Looking up at adjustable telescopic discharge chute beneath cement-weighing batcher. Chute is operated by batcher operator from operating platform and can be extended downward for low or small-size truck-mixers, and retracted for high or large-size truck-mixers.

Many of the modern cement-weighing batchers include an extra weighing beam so that the operator can have visual indication when the cement-weighing hopper is empty. Frequent checks during the operation of the plant with this auxiliary beam will take care of the possible hang up of cement in the weighing hopper. Too much emphasis can not be placed on the necessity for testing and checking the cement-weighing batcher frequently.

Water-Measuring Tanks The majority of ready-mixed-concrete plants now include a water-measuring device located on the platform of the batching plant for the measurement of water. The batcher operator who handles the weighing of the aggregates and cement also operates the water-measuring device. In many plants the practice has been established of discharging the water from the water-measuring device into the drum of the truck-mixer along with the aggregates and cement.

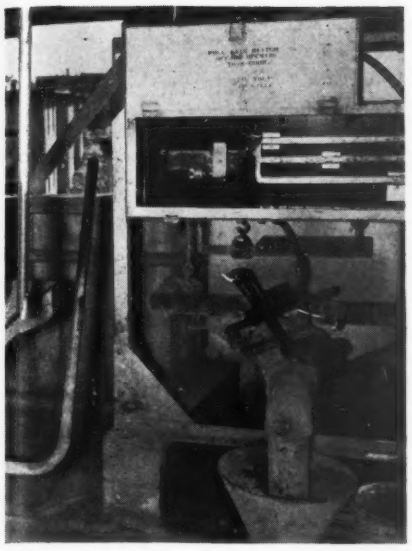
Water-measuring devices are generally of two-types: weight and volume.

The maintenance of the scales on a water-weighing tank should receive the same treatment as that recommended for aggregate- and cement-weighing batchers. While the scales are smaller and of much less capacity than those used for aggregates, the elements of the scale mechanism are exactly the same. The scales should be tested periodically with test weights.

Tightness of the inlet and discharge valves should be maintained at all times. Water valves wear and get out of adjustment. Inspection will disclose whether there are any leaks and proper correction can be made.

The inlet pipe should not come in contact with the water-weighing tank, and the tank, discharge valves and operating lever for this valve should not touch any fixed object around the plant.

If the water tank is too slow in its operation, consideration should be given to using larger pipe for the supply and discharge. Steel baffles can be welded into the bottom of the tank to prevent the swirl of



Water-weighing batchers provide centralized control and an extremely accurate check on the amount of water going into the mix. They may be fully automatic or manually operated. Provision is made on the beams to allow for the amount of moisture in the aggregates.

water during discharge. The swirl of water as the tank approaches the empty condition slows up the discharge.

If there are large variations in the water pressure in the supply line, a pressure regulator can be installed to help maintain an even operating pressure.

Water-weighing tanks are in many cases equipped with electrically operated inlet valves so that the flow of water will be cut off when the correct weight of water is in the weighing tanks. A simple wiring diagram of the automatic control for the filling valve should be available at the batching plant so that a local electrician can make adjustments or repairs when necessary.

Most of the volume-measuring tanks are of the open-top type and fill to a constant predetermined level controlled by means of a float valve. Variation in the batch of water is regulated by means of an adjustable discharge pipe inside the tank. Float valves must be carefully watched for accuracy and leakage. Also, the adjustable discharge pipe should be checked with the calibrated gage on the outside of the tank periodically. Tightness of the valves is important with the volume-measuring tank also.

Constancy of pressure in the supply line is more important with the volume-measuring tank than with the weighing tank. Every attempt should be made to regulate the pressure of the water supply so as to keep it as near constant as practicable.

Some plants employ water meters instead of weighing or volume tanks for the purpose of measuring water. These water meters can be quickly tested by filling a container of known volume to a given level and checking the volume of water discharged into the container against the setting of the meter.

The determination of the moisture content of the aggregates continues to be a troublesome problem in ready-mixed-concrete plants. The most rapid and practical method known involves the use of a small table scale and a small metal container of predetermined volumetric content and weight. Claims are made that a moisture determination of the sand can be made in approximately one minute with this apparatus.

The weighing type of water-measuring tank has the advantage of being self-computing as far as subtracting from the measurement of water for the moisture contained in the aggregates. If the amount of moisture in the aggregate is known, it can be deducted from the total amount of water to be measured for the batch by means of auxiliary beams and poises included with the water-weighing scales.

Concrete-Block Prices Range from 25 to 10c

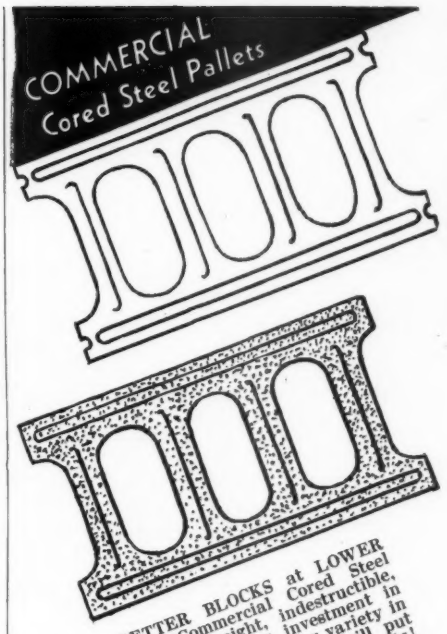
Concrete blocks are currently selling at an average price of 15 cents per 8- by 8- by 16-inch plain-faced, gravel-aggregate unit, according to a recent survey among 57 cities in the United States.

The retail delivered price is highest in Portland, Maine and Mobile, Alabama, where the quoted figure is 25 cents. New Orleans, Shreveport and Savannah dealers are obtaining the next highest figure, 20 cents. The lowest price—10 cents per unit—is reported prevailing in Omaha, Grand Rapids, Michigan and in Indianapolis.

Current retail-delivered prices in some of the larger cities are as follows: Boston, 15 cents; New York, 13 cents; Pittsburgh, 17 cents; Chicago, 16 cents; Detroit, 12 cents; Cleveland, 15 cents; St. Louis, 13 cents; Minneapolis, 14 cents.

The Armco Drainage & Metal Products Company of Denver has purchased the plants and assets of the Ontario Concrete Pipe Company of Ontario, Oregon, and will continue to operate the chain.

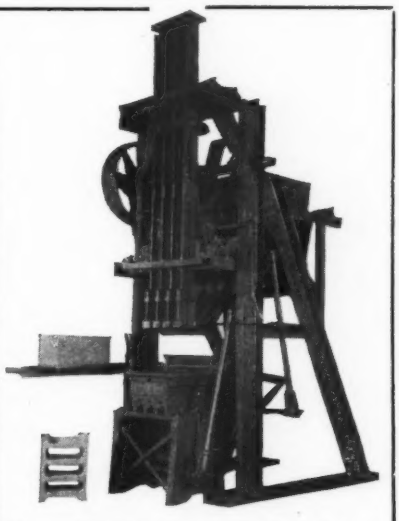
Besides the plant at Ontario other plants are located at Boise, Caldwell and Twin Falls, Idaho.



Make BETTER BLOCKS at LOWER COST with Commercial Cored Steel Pallets. Light weight, indestructible, compact. Require less investment in machinery and permit wider variety in product shapes. Our pallets will put you *Blocks Ahead* in output and profits!

The COMMERCIAL SHEARING and STAMPING CO.
Youngstown, Ohio

For economical Block Production



An All-Purpose Machine

The Junior Stripper will turn out more blocks per man than any other hand-operated machine on the market . . . 200 per hour being easily maintained! Nor has quality of output been sacrificed for the sake of speed. Units are uniformly dense, true to shape, of uniform texture.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers, and Cast Iron and Press Steel pallets Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

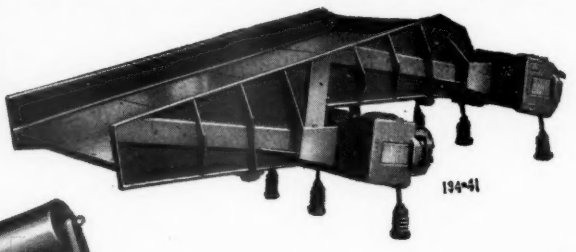
ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager **Columbus, Ohio**

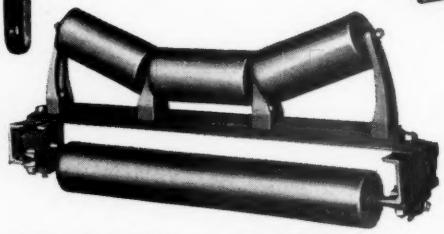
The CONCRETE MANUFACTURER

CHECK THESE SERVICE FACTORS

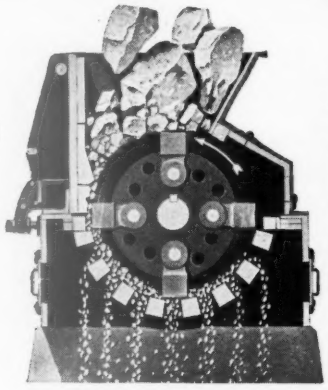
A type and size chain for every conveying, elevating and power transmission need. Peerless, detachable and steel knuckle are shown.

In handling quarry materials, of course you want economy, efficiency, and maximum freedom from costly and annoying maintenance problems. You get these in Jeffrey products, designed and manufactured for handling stone, gravel, sand, etc.

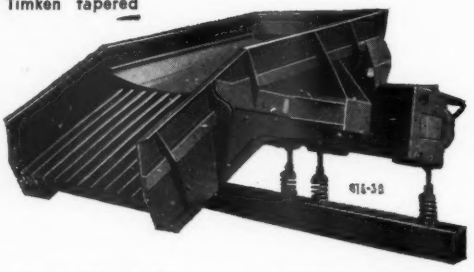




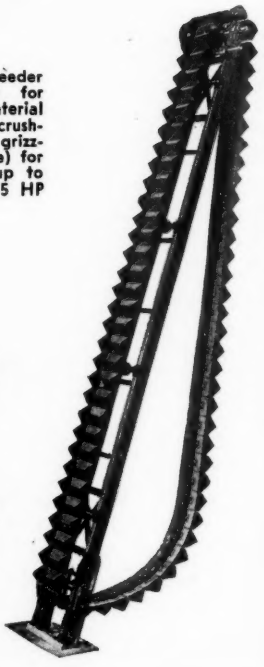
Jeffrey belt idlers are furnished in both troughing and flat belt types in widths from 14" to 60". Heavy steel rolls, accurately balanced and equipped with Timken tapered roller bearings.



Jeffrey-Traylor grizzly feeder (right) for by-passing fines ahead of primary and secondary crushers, screens, picking belts. Also electric vibrating screens and feeders (patented). The Jeffrey Miracle hammer crusher (left) is used for reducing large pieces of limestone, shale, slag and cement rock. Steam shovel size to 1", 2", 3" or 4" and under in one operation.



Jeffrey-Traylor electric vibrating feeder (patented) J-T feeders ideal for handling large run-of-quarry material from surge hoppers to primary crushers, hammermills, trommels or grizzlies. Special large feeder (above) for handling 48" lumps at rates up to 2000 T.P.H. with maximum of 15 HP required.



Operating conditions, capacity or class of material make no difference—there is a Jeffrey bucket elevator to do the job. A complete line of standardized units. An inclined continuous elevator is shown right.

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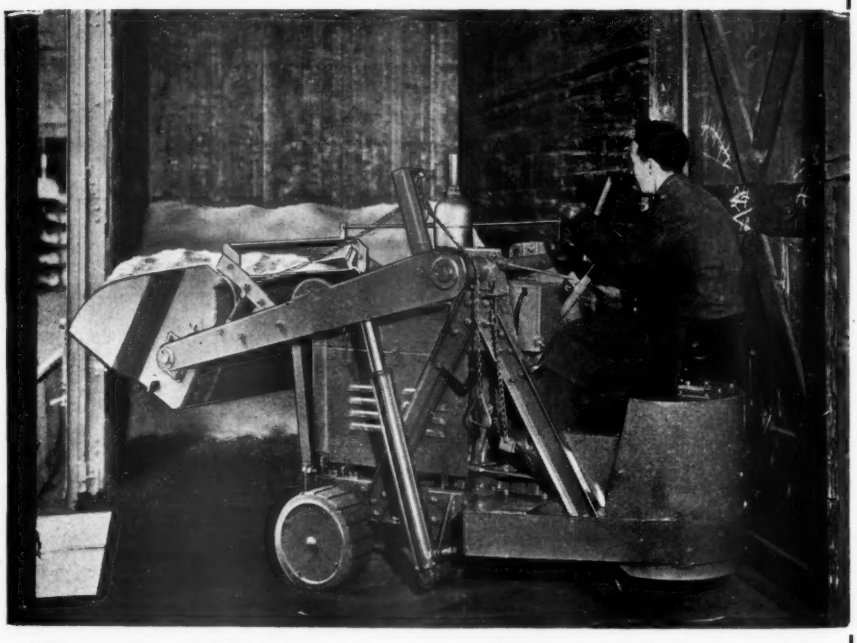
YOU DON'T NEED A CARSCOOP

IF YOUR LABOR RATE IS A DOLLAR A DAY

But usually the unloading crew must be paid a little more than that these days—when men are to be had at all! If this is so, then call on the Butler Carscoop to solve your handling problems. Designed for unloading bulk materials from boxcars, this machine will handle dried clay or lead concentrates, bulk cement or brass bars, with equal ease. Ask for full information today.



Maneuvering within the narrow confines of a boxcar is no trick for the Carscoop, with its 6½ foot turning radius. A single machine will unload 300 bbls. of bulk cement in an hour and a quarter.

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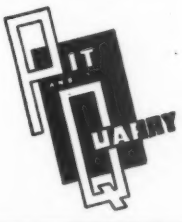

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In 2 years of war building, the ready-mix industry has made 10 years' progress in educating contractors to the advantages of mobile, flexible concrete delivery.

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Now that war regulations limit the building of new truck mixers, we recommend two maintenance measures:

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2. ARRANGE WITH YOUR JAEGER DISTRIBUTOR FOR A REGULAR 30-DAY CHECK-UP ON EVERY MACHINE.

THE JAEGER MACHINE COMPANY
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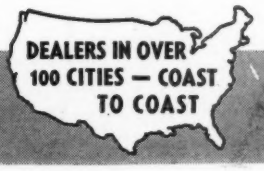
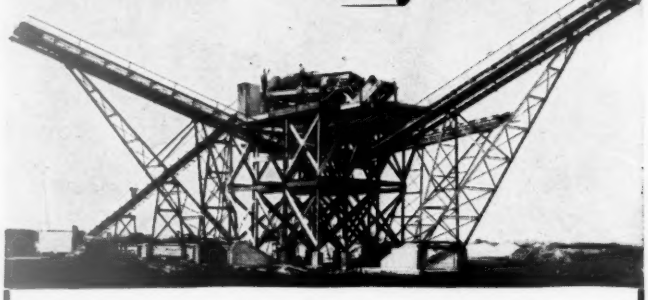


Via Barber-Greenes



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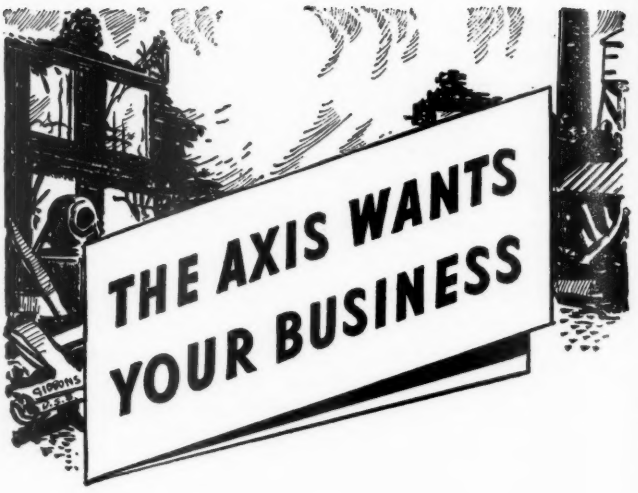

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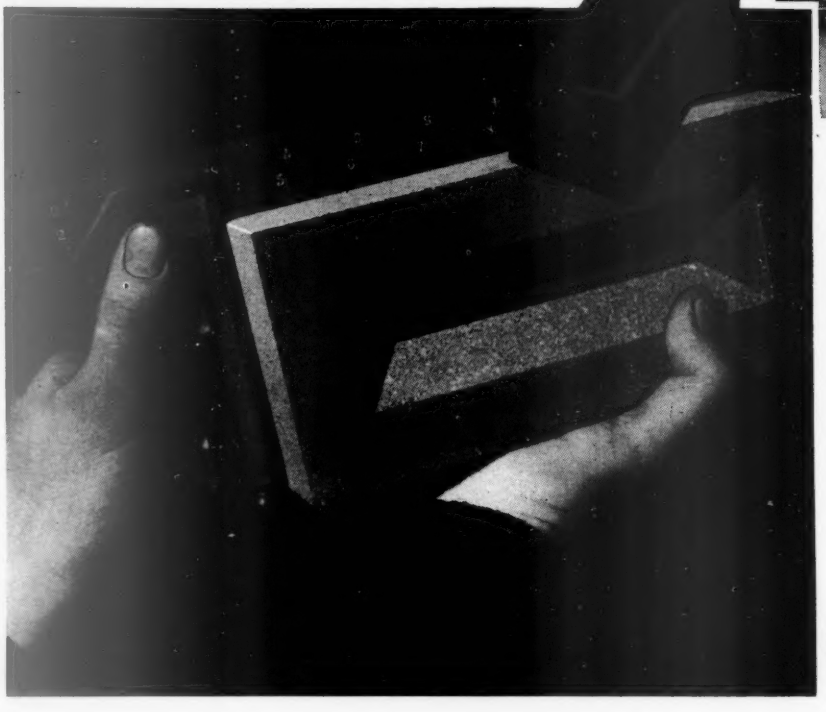
Either frog-type or solid concrete bricks can be produced at the rate of up to 14,000 in an eight hour day (on model C machine shown here) or up to 28,000 per day on the larger type A machine.



Above: The Jackson and Church plant shown above was constructed of J & C made bricks. Producers find that J & C made bricks are easier to sell because of their uniformity, quality and appearance. J & C units produce plain or colored bricks from Haydite, Waylite, Superock, Pottsco, cinders and other light weight aggregates. From a single sack of cement, with a J & C machine, up to 320 concrete bricks can be made, with strengths as high as 3700 pounds per square inch and absorption as low as 6%. For complete information write to Jackson and Church Co., Saginaw, Mich.

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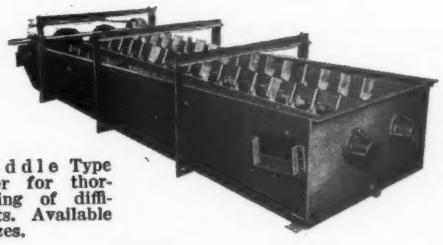
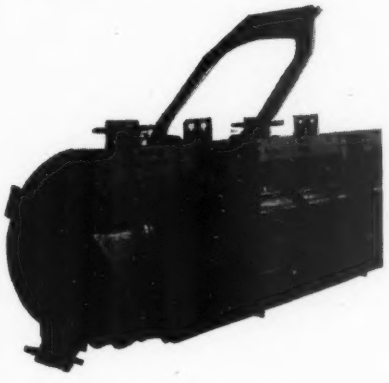
Eagle Equipment has met all peace-time requirements for nearly two generations, and is now meeting the accelerated demands of the war effort.



EAGLE Paddle Type Log Washer for thorough cleaning of difficult deposits. Available in many sizes.

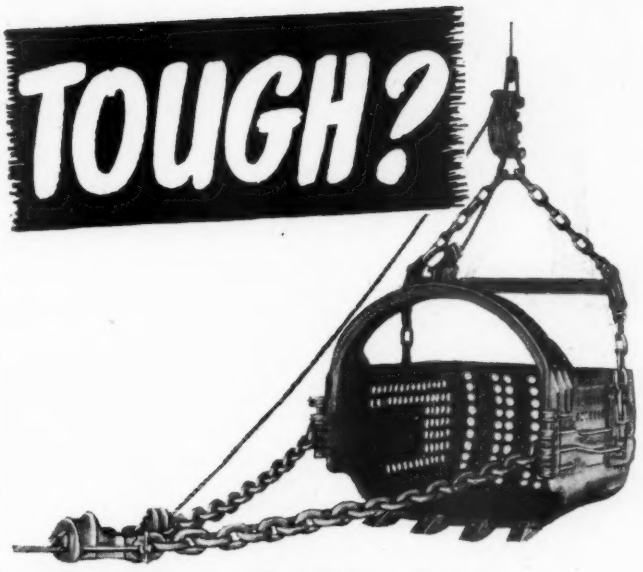


Our EAGLE "Swintek" Screen Nozzle Ladder is indispensable for profitably working deep or refractory deposits. Eliminates slug pumping. Reduces power, time and labor losses. Insures lowest production costs per yard.

Write for bulletins describing the EAGLE line of sand and gravel processing equipment, including Sand Tanks, Screw Dewaterers and Classifiers, Shale Removers, Steel Barges and Pontoons.

EAGLE IRON WORKS • Des Moines, Ia.

TOUGH?



You bet they're tough . . . we build 'em that way!

★ Strength . . . durability . . . toughness . . . important features built into every HENDRIX *Lightweight* Dragline Bucket to assure years of trouble-free service under all kinds of digging conditions. Engineered for greater "digability," there's a Hendrix bucket for every dragline digging job.

ALL-WELDED CONSTRUCTION . . . *no rivets*

10% to 14% MANGANESE STEEL CHAINS AND FITTINGS

20% to 40% LIGHTER THAN OTHER BUCKETS, *type for type*

PERFECT DISTRIBUTION OF WEIGHT *provides greater ease of handling*

GETS PAY MATERIAL EVERY TRIP *even in wet digging*

LARGE BUCKET CAN BE USED ON SMALL MACHINE *or long boom*

FILLS QUICKER, DUMPS CLEANER *either wet or dry*

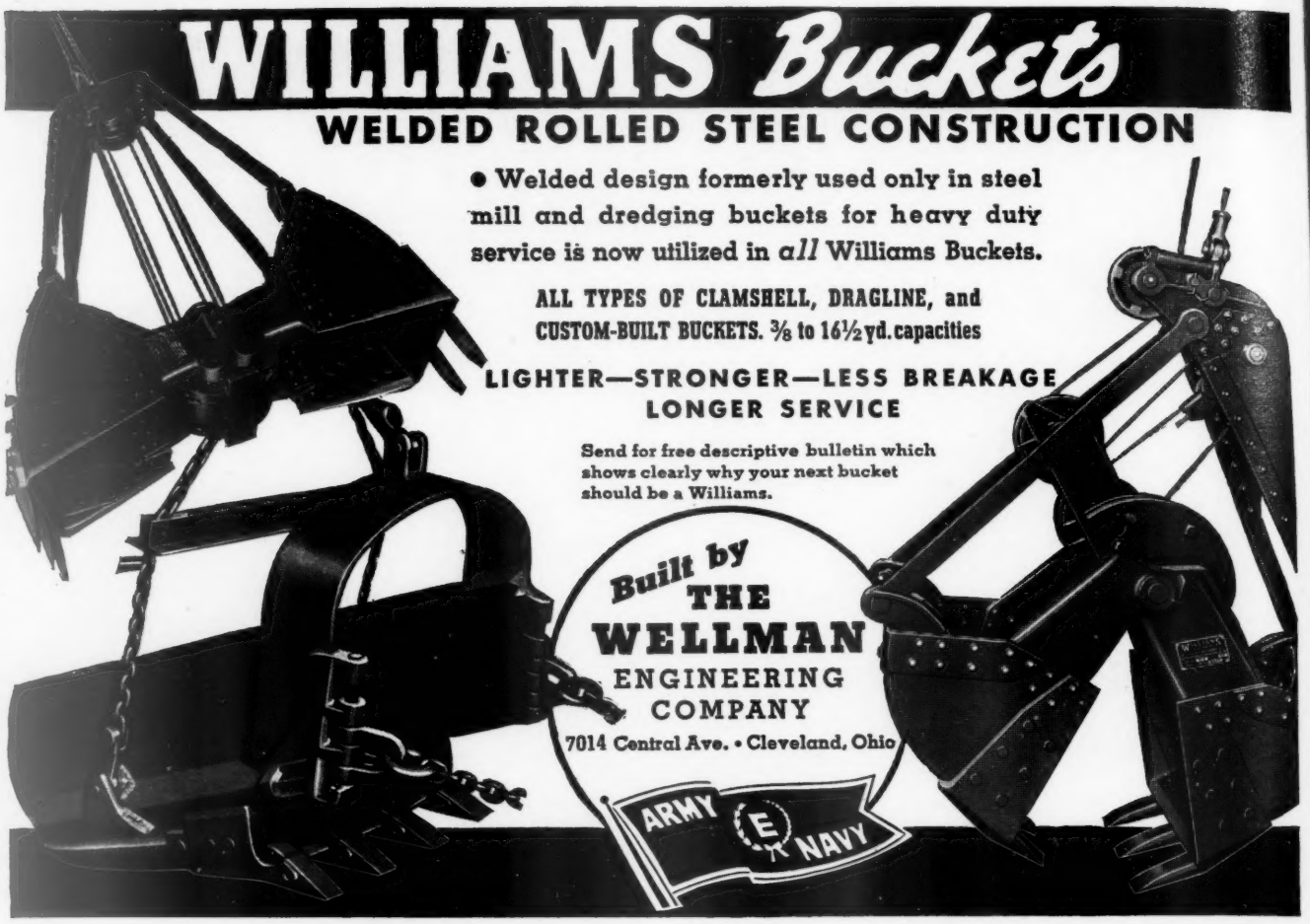
AVAILABLE IN THREE TYPES—⅜ yd. to 20 yd. Perforated or Solid. . . . Write today for specifications, descriptive literature and prices.

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

DESOTO FOUNDRY, INC. ★ MANSFIELD, LA.

WILLIAMS *Buckets*

WELDED ROLLED STEEL CONSTRUCTION



● Welded design formerly used only in steel mill and dredging buckets for heavy duty service is now utilized in *all* Williams Buckets.

ALL TYPES OF CLAMSHELL, DRAGLINE, and CUSTOM-BUILT BUCKETS. 3/8 to 16½ yd. capacities

LIGHTER—STRONGER—LESS BREAKAGE
LONGER SERVICE

Send for free descriptive bulletin which shows clearly why your next bucket should be a Williams.

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THE
WELLMAN
ENGINEERING
COMPANY
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ARMY E NAVY

FORTIFY POINTS OF EXTRA WEAR WITH

BERGSTROM *Free Flowing*

HARD SURFACING ELECTRODES

IF you operate any equipment on which some surfaces are subject to extra wear, these electrodes can help prevent troublesome breakdown—and save money. They deposit a layer of metal that has extra resistance to abrasion and corrosion. Bergstrom Electrodes flow freely—do not form scale. Easily applied in any position.

WRITE FOR FREE INFORMATION.
We will send you an outline of the specific job each of the six types of Bergstrom Electrodes is designed to do.

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you should specify
SIMPLICITY SCREENS

Years of operating experience in many hundreds of plants and in many industries have been utilized to produce a screen which contains all these important features: Large Capacity, Positive Action, Durable Construction, Perfect Balance, Freedom from Blinding and Rubber Cushioned Power.

Users everywhere acclaim SIMPLICITY as the truly superior screen.

Our engineers will gladly study your particular screening problem and make a definite recommendation for its most practical solution.

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DURAND . . . . . MICHIGAN

LIGHTNING Ribbed CONVEYOR BELT

Will Cure Your Water Trouble

The LIGHTNING RIBBED CONVEYOR BELT has been tested under a variety of the severest conditions. It has demonstrated that—

—it carries more yardage per dollar of cost than any other belt.

—it keeps the load from slipping even on the sharpest inclines.

—it has yet to encounter a moisture problem it could not solve.

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Factory and General Offices
Park and Watt Sts., Oakland, Calif.

More than 35 years experience in the manufacture of rubber products

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One Man SPREADER

Flink Spreads Wet or Dry Lime Faster — at Lower Cost —

There is no other lime spreader on the market comparable to the Flink. Designed strictly for the commercial spreader. No helper is required on the back as the Flink is operated by the driver of the truck.

Does not limit use of truck. Fits on end like tail gate.

Spreads wet or dry material evenly up to 1" in size, up to 28 ft. in width. Built for hard use. Time tested. Hundreds in use throughout America. Write for complete literature.

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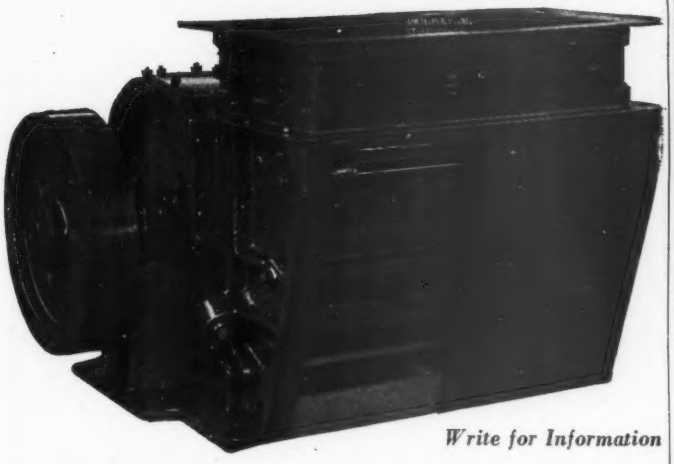

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AMERICAN Hammermills and Ringmills are the first choice of experienced operators everywhere. Known for their rugged dependability, high capacity and low operating cost, they can end your pulverizing problems for all time. Agricultural stone demand is greater this year than the apparent supply. Let AMERICAN produce for you at a profit. Get the fact now!

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SHOVELS and CRANES GIVE YOU MORE!

They Deserve Good Care

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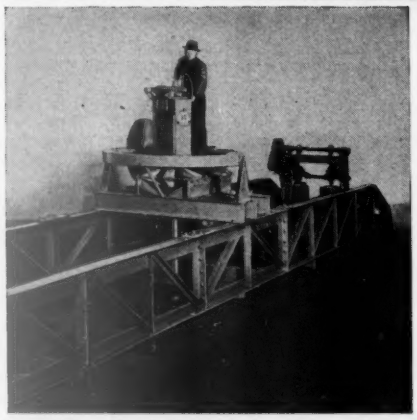
MARION, OHIO



DENVER LOWHEAD THICKENERS

THESE DENVER SPIRAL RAKE THICKENERS are now available in the lowhead beam type design in sizes up to and including 75 feet in diameter. Patented spiral rakes move the material to center cone in one revolution. A Denver Spiral Rake Thickener will reduce your costs Write today for a copy of Bulletin No. 3628.

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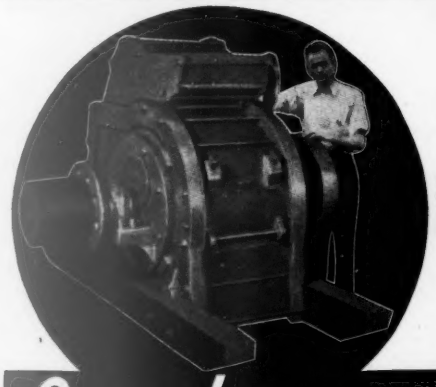

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of every description
for maximum productiveness from your vibrating screens.
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SCREENS · CRUSHERS

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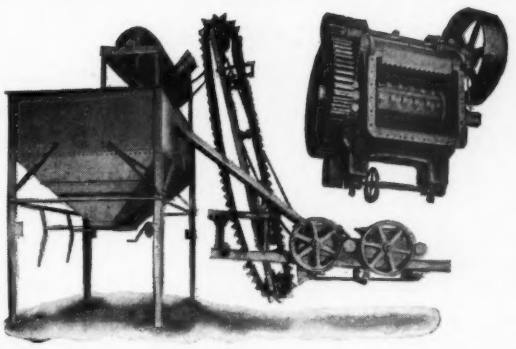
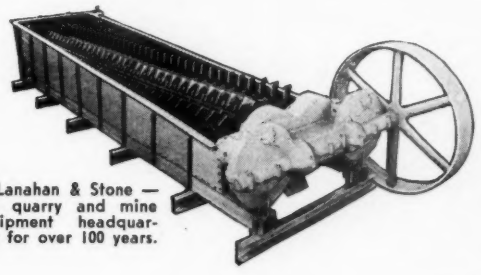


McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs and hoists — complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.



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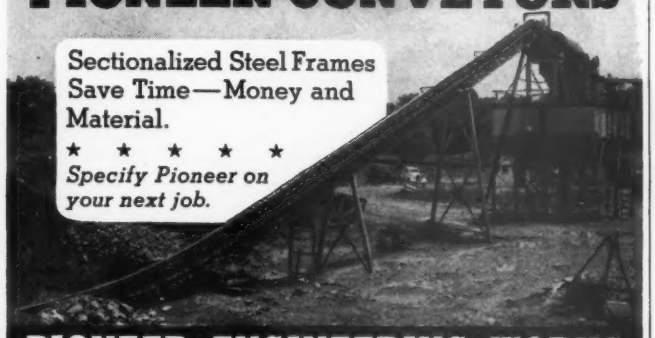

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Prompt Delivery. Best all around conveyor and power belt lacing because it can be applied with a hammer. Comes in handy packages or long lengths for conveyor belts. It compresses belt ends, prevents fraying. Comes with 2-piece hinged rocker pins. Write for Catalog showing the most complete line of belt lacing made.

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for Making 1¼", ¾" or Agricultural Limestone...

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● Handles Large Stone or Screen Rejects ●

Rows of heavy, free swinging, fast revolving hammers, crush the material by impact until of proper size to pass through the grates. By reducing large rock to 1¼", ¾" or agricultural size in one operation, the "Slugger" has enabled operators to produce these sizes at a very low cost per ton and with small investment. Seven sizes—6 to 150 tons hourly capacity.

The Williams Patent Crusher and Pulverizer Co.

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PATENT CRUSHERS GRINDERS SHREDDERS

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ROLLER MILLS
CRUSHERS
GRINDERS
SHREDDERS

Sale of the plant and equipment to the Heat & Power Co., Inc., 45 Bond St., New York City, liquidators for war production constitutes one of the largest recovery projects of its kind in the country. WPB said.

WORLD-TELEGRAM
MARCH 13, 1943

VU

CEMENT-MAKING EQUIPMENT

KILNS

6—Vulcan Iron Works steel rotary kilns, 6′6″ x 7′6″ dia. 125′ long, fire brick lined
2—Vulcan Iron Works steel rotary kilns, 7′6″ x 7′ dia. 125′ long, fire brick lined
7—W. F. Mosser & Son steel rotary kilns, 5′6″ x 5′ dia. 60′ long, fire brick lined

PULVERIZERS

26—42″ Fuller Lehigh pulverizers, each with belt idler
3—33″ Fuller Lehigh pulverizers, each with belt idler

CRUSHERS

1—Allis Chalmers Fairmont Roll Crusher, 36″x60″
2—No. 6 Gates gyratory rock crusher
1—No. 6 McCully gyratory rock crusher, style K
5—No. 5 Gates gyratory crushers
1—Messer rotary clinker crusher
1—No. 10 McCully gyratory rock crusher
1—Jeffries 24″x24″ single roll coal crusher

Two Complete COAL PULVERIZING PLANTS

Consisting of:

4—Fuller Lehigh Pulverizers—Jeffrey 24x24 Coal Crusher, Ruggles 6′x41′ Rotary Dryer, Conveyors, elevators, etc.
3—Fuller Lehigh Pulverizers — 5 x 30 Ruggles Rotary Dryer, Conveyors, elevators, etc.

DRYERS

3—W. F. Mosser & Son steel rotary dryers with 65″ steel stack
2—W. F. Mosser & Son steel rotary dryers, 72″x60″ dia. 60′ long, bevel geared drive, each with counter shaft and 40′ steel stack
1—W. F. Mosser & Son steel rotary dryer, 72″x60″ dia. 55′ long, bevel gear drive, with counter shaft and 35′ steel stack
1—W. F. Mosser & Son steel rotary dryer, 72″x60″ dia. 55′ long, bevel gear drive, with counter shaft and 50′ steel stack

QUARRY

2—steam shovels, Bucyrus, 70-ton 2½ yards

QUARRY EQUIPMENT

1—steam shovel, Vulcan Little Giant, 35-ton 1¼ yards
1—Double drum steam hoist, S. Flory Mfg. Co., 11″x14″ duplex
3—Brookville Fordson locomotives
1—Westinghouse 60″ single drum electric hoist
1—Bucyrus No. 40—R steam shovel

AIR COMPRESSORS

1—Ingersoll-Rand 18¼″x14″x18″ horizontal duplex air compressor, belted motor drive, with 3′6″x20′ riveted steel air receiver
1—Ingersoll-Rand Duplex Air Compressor, 11″x16″ and 18″x16″ belted motor drive

BUCKET ELEVATORS

Thousands of feet of Bucket elevators, all sizes of buckets, mostly all steel encased

MILLS

1—Williams Mill, size 3
5—No. 8 Krupp steel ball mills, spur geared, with counter shaft
1—Allis Chalmers Compeb Mill complete, gear driven from counter shaft through magnetic clutch, and with induced fan ventilation and dust collectors
14—30″ Griffen Mills
1—Bradley Hercules Mill complete with stillated die ring, feeder, counter shaft

REPRESENTATIVE ON THE PREMISES

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24 Steel Buildings for Re-erection

2 complete CEMENT PLANTS
2,400 and 4,000 Barrel Capacity

1—Allis Chalmers steel ball mill, 7′ dia. x 30′ long, spur geared with rope drive

CONVEYORS

Rubber Belt Conveyors 16″, 20″, 24″
Continuous Pan Conveyors, 18″ Link Belt
Steel Screw Conveyors, 12″, 16″ in steel box
Steel Screw Conveyors, 8″ in steel trough
Canvas Belt Conveyors, 30″

3 BOILER PLANTS COMPLETE

2—Edgmoor Waste Heat Boilers, 800 HP each 200 lbs. pressure, complete with motor driven fans, economizers, super heaters, and steel stacks
3—800 HP Babcock & Wilcox Waste Heat Water Tube Boilers, 200 lbs. working pressure, complete with motor driven fans, economizer, and steel stacks
2—400 HP Babcock & Wilcox Water Tube Boilers, 200 lbs. pressure, Combustion Eng. Co., type E stokers

All complete with Generator Boiler Feed Pumps and Feed Water Heaters

230 v. D.C. ENGINE SETS

1—Penn. Iron Works, horiz. cross compound Corliss steam engine, direct conn. to 475 KW G. E. generator, 100 RPM
1—Allis Chalmers 18″x36″x42″ horiz. cross compound Corliss steam engine, direct conn. to 400 KW Allis Chalmers generator, 100 RPM
1—C & G Cooper Co. 24″x40″x36″ horiz. cross compound Corliss engine, direct connected to 575 KW Cr. Wh. generator
1—Robt. Wetherill & Co. Tandem Compound Corliss Steam Engine, 20″x34″x42″ direct connected to 440 KW A1. Ch. Gen.
1—Rice & Sargent Cross Compound Corliss steam engine 24″x48″x48″, direct conn. to 800 KW G. E. Gen.
1—Southwark F & M Co.—Cross Compound Corliss Steam Engine, 24″x-48″x48″ direct conn. to 750 KW G. E. Gen.

All above complete with switchboards.

DUST COLLECTING SYSTEMS

6—W. W. Sly Dust Collecting systems, each with exhaust fan, 10 HP motor and cyclone dust collector

D.C. MOTORS

1—300 HP Electric Dynamic 500 RPM
2—250 HP Wsghse
3—150 HP Diehl Mfg. Co.
1—150 HP Gen. Elec.
1—125 HP Gen. Elec.
1—125 HP Gen. Elec. 550 RPM
1—110 HP Wsghse
1—100 HP Wsghse
1—100 HP All. Chal. 335 RPM

Hundreds of motors from 7½ HP up. All with starters.

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Complete machine shop consisting of 7 Lathes, 2-12″, 3-24″ and 24″ 40″ Swing 5′, 6′, 10′, 12′, 2-18′-22′ beds. Drill press, bolt threading machines, shaper, slotting machines, planers, milling machines, steam hammer.
Vertical double head boring mill, 57″

MISCELLANEOUS

2—Howe Scales 52″x70″; Fairbanks Morse Scale 42″x42″
4—Buffalo Forge Blowers & exhausters. Pumps, Shafting, Pulleys, etc., over 50 steel plate storage bins and Hoppers, various sizes
2—Poidometers, 1—30″ x 4′6″ and 1—20″ x 4′6″, each with standard hoppers and 3 HP motor.

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Drag Scrapers
1 Sauerman, 2½ cu. yd., bottomless
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1 set Blocks and Sheaves for above

Hoists
1 Clyde, 2-drum, expanding band, roller bearing. Capacity: 14000# at 300 F.P.M. front drum, 4700# at 600 F.P.M. rear drum.

Engines
2 Twin City, 4-cylinder, 28 HP, gasoline
1 Continental, 4-cylinder, 100 HP, gasoline, with pulley and V-belts.
21 LeRoi, 2-cylinder, 8 HP, gasoline engines with clutches and power take-offs.

Ready-Mixed Concrete Tanks
18 Clinton 3½ cu. yd. Agitators
3 Clinton 2 cu. yd. Agitators

Screens, Vibrating
1 Coyle & Roth, 3' x 6', single deck
7 Link-Belt, 4' x 10', double deck
1 Link-Belt, 5' x 10', single deck
1 Symons Rocker, 4' x 8', double deck
2 Tyler Hummer Screens, 4' x 8'

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1 Link-Belt, 6' x 16', 4" openings, with drive and trunnions

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1 LeTourneau AD-3C with steel wheels

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1 LaPlant-Choate C-4 Hydraulic pneumatic-tired 4-cu. yd. wheel scraper

Bucket
1 Hayward 2-cu. yd. Reh. Clam Bucket

Maintainer
1 W. A. Riddell 12' pneumatic tired road grader

Feeders
1 Jeffrey-Traylor, 48" pulsating magnetic scalping feeder
2 Link-Belt 3' x 6' plate feeders

Crushers
1 Allis-Chalmers McCully Gyratory, 16"
1 Allis-Chalmers McCully Gyratory, 6"

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Conveyor head and tail pulleys
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Link-Belt Rotoscope
Sand cones
Electric Motors, 35 to 125 H.P.
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22 ton Howe Truck Scale, 24'. Fairbanks, 20T. 30'.
24 ton Howe 24 ft. 6000 lbs. Fairbanks Warehouse, 5 8x6'.
No. 37 TZ Traylor 36", 7" B Newhouse, No. 8 Allis Chal; Gry. Crushers.
32" Bucket Elevator, 95'c.
12'x12' Incline Holding Drum & Structure, 5700' 1" cable.
Thomas S. Drum Hoist, 12"x22". Elec;
Mundy S. Drum, 14"x26" drum.
2 Drm Mundy, 4 cyl; Hercules Gaso. Motor.
Airplane Motor; Hall Scott, 100 HP 1450 RPM. @ 1.
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1—3", 1—6", DeLaval, 4 & 6" Buffalo, 8" F. M. Cent. Pumps.
4x5 Worthington Triplex Pump with motor.
3—Double Roll Sand Crushers, 26"x30". Mang. Rims.
C. Iron Table, 10'8" dia; Smooth Surface, 18" hole center, 2¾" thick.
Lincoln Iron Wks. Stone Gang Saw, @ 1 cond; complete.
2—190 HP. Miller Gas Engines, 20 HP Bessemer.
10 tons 24 lb., 75 tons 40 lbs. Relay Rails. Switches, 4—2 yd. 10—4 yd. Koppel cars, 36" ga. 1-Yd. 24" ga. 3-4 yd. Western, 36" ga.
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3—100 KVA Pgh. Transformers, 22,000-2300 volts.
Safety Switch, 600 Amps, 400 Amps fused & 60 Amps fused, all 99% new.
5-7½-10-15-20-40 & 75 HP Motors, 220 v. Starters.
Shepard Monorail Hoist, 4000 lbs., 230 V.D.C.
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30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
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14"	6	8"	6	4"	5
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Cummer Asphalt Plant—One ton box. New 1940. Located in New England. Complete for $22,000.

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One (1) P&H 206 ¾ yd. dragline.
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30-ton American stiff leg derrick 30' mast, 55' boom
60 HP electric hoist
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1 Farrell Jaw Crusher, size 20"x10".
2 Rotary Revolving Segment Screens, size 56"x18'.
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1 Belt conveyor, 20" wide, 55 ft. centers. All complete with foot wheels and head wheels.
Large quantity of belting and shafting.

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One Traylor Reduction Crusher 1 ft. 8" T.Y.

One Good Roads Roller Bearing Reduction Crusher 10x30.

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60 Caterpillar Tractor & Bulldozer
Fordson-Galion 3-wheel Roller (5 ton)

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Drums 22" Dia. 25" Wide—Flange 4"
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Excellent Condition

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2—No. 33 I-R Drill Sharpeners

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10x36 Jaw Crusher, 28' Bucket Elevator
Power unit, 36"x12' Revolving Screen and 30' Return Belt Conveyor, mounted on steel wheel truck.
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Superior Iron Wks., 36" dia. drum with 80 H.P. G.E. MTC motor, brake & starter.

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38 years' experience
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One No. 6 CHAMPION Crusher, Manganese Jaws. Capacity at least 50 tons per hour. Used Very Little. Owner has no further use for it. Priced to sell immediately.

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Bonded Double-Roll Stoker Coal Crusher....$295.00
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2—General Electric Motors Type KT 40 HP 1175 RPM

440—220 Volts—3 Phase—60 Cycle
Never in Service.

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10½"x22" New England Jaw Crusher
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Single roll 24"x38" heavy duty coal crusher
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2 Jigger vibrating screens, 2 deck 2'x5'
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40' elevator 12" malleable buckets on chain
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20" trough belt conveyor up to 350' ball bearing idlers
36" trough belt conveyor up to 200' with belt
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42" trough belt conveyor up to 260' with belt
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I-R portable 275 CFM with 50 hp Waukesha engine

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3 electric car pullers
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2—PLYMOUTH Model FL, 4 Ton, 24" Gauge Gasoline Locomotives.
1—WHITCOMB Model CS-4, 4½ Ton, 24" Gauge, Gasoline Locomotive.
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PRICED FOR QUICK SALE

1—Link Belt Shovel Boom Assembly with 1 yard Amsco dipper, excellent condition, will fit models K1, K2, K35, K42 .....$750.00

1—P&H ¾ yard Shovel Boom Assembly for Model 206.....$500.00

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1—Allis-Chalmers Blake Type Jaw Crusher 10"x20" $800.00

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

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1—#5 Allis Chalmers Gates gyratory crusher, ser. #5331, opening 10 x 38".
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1—#2 Climax jaw crusher, size 9 x 16".
1—Buchanan jaw crusher, size 10 x 16".
1—Acme jaw crusher, Ser. #1873, size 12 x 20".
1—Acme jaw crusher, Ser. #1686, size 9 x 16".
1—United Iron Wrks., "Blake-type" jaw crusher, size 9½ x 24".
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18x36" Farrell-Bacon Jaw Crusher.
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Elevators. Screens, Cars.
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100' Boom Stiffleg Derrick with 75 HP 3 Dr. Elec. Hoist.

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1 888 cu. ft. Type XB-2 Ingersoll Rand air compressor complete with 125 HP Allis-Chalmers motor. Excellent condition.
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1 No. 2 Style C rotary fine crusher made by Sturtevant Mill Co.
1 Cameron No. 2 HV centrifugal pump, 100 GPM, 100 lbs. pressure.
1 P. & H. 29' span steel I beam crane, 3 motors, ground control, 3/60/220.
1 300 HP, G. E. synchronous motor 3/60/2200
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1 Blondin cableway, 600 ft. long, also hoist and 50 HP electric motor, all complete. Trip hammers.
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Tractor Cat 60 with hyd. bulldozer
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1500 HP in one or more units with or without Generators. Single unit preferred. Give full information.

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Estimates Furnished Without Obligation
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BUCKETS
1—½ yd. Blaw Knox Clamshell
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38 years' experience
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"Anything containing IRON or STEEL"

FOR SALE
P&H 300 Comb. shovel & Dragline ½ yd.
Cedar Rapids 9x24 Portable jaw crusher.
Badger portable Crushing plant, 9x36.
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Parsons Backfiller. Mod. 32.
2—Backhoe attachments for 400 and 600 P. & H.
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International TD-35 Tractor with High Lift.
Caterpillar 30 Tractor with winch & side boom.
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Used shovel, dragline, crane, back hoe or any other kinds of used machinery. Also suction dredger or clamshell dredger, tug boats, barges, used dredge pipe, wire rope cats., used dump trucks.

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OFFERED AT 85% OF NEW PRICE

1—P. D.-80 Int. Diesel power unit used 3 months. Nearly New Worthington wagon drill on rubber.

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One 56S Smith tilting mixer, needing slight repairs.

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16, 20, 24 or 30 cubic yard
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Any quantity, type, make or location.
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Drum 60" Dia., 36" Face, Grooved for 1" Cable, 8" Shaft, Brake Drum 67½" Dia., 9" Face—G. E. Emergency Brake. G. E. Slip Ring Motor, 150 H.P., 3 Ph., 60 C., 440 V., 720 R.P.M., Serial No. 5196349 with electric drum controller, disconnect switch, magnetic contactors and resistor bank all mounted on one frame 76" x 13'6". Condition same as new.

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One (1) Link Belt Apron Feeder. 8' Centers, 18" Wide with ¼" steel pans.

One (1) 18' x 18" Jeffrey Apron Feeder.

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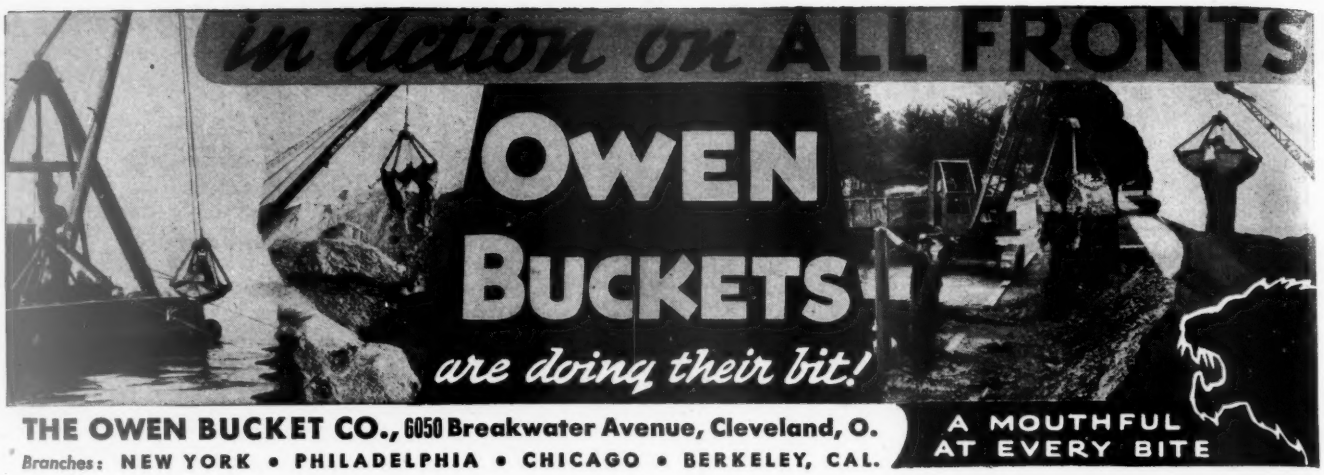

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Index to Advertisers

* Albrecht Company, E. J.....103
*Allis Chalmers Tractor Division.. 4
*American Cable Div. American Chain & Cable Co., Inc.....Inside Back Cover
*American Chain & Cable Co., Inc. .....Inside Back Cover
American Manganese Steel Division 63
*American Pulverizer Co..... 91
American Rubber Mfg. Co..... 91
Anchor Concrete Mchy. Co..... 83
Armstrong-Bray & Co..... 93
Atlas Powder Co..... 16
*Austin-Western Road Machinery Co. 8

Bacon, Inc., Earle C..... 68
*Barber-Greene Co. 86
Barjohn Corp., The..... 99
Bemis Bro. Bag Co..... 6
Birmingham Rail & Loco Co.... 96
Brill Equipment Co..... 97
Broadcast Section 94-103
*Brooks Equipment & Mfg. Co.... 92
*Buda Co., The..... 10
*Buell Engineering Co., Inc..... 32
*Buffalo Wire Works Co., Inc.... 71
Burnham, Royal E.....102
*Butler Bin Co..... 84

Carlyle Rubber Co., Inc..... 99
Casellini-Venable Corp. 102
Chicago Perforating Co..... 66
Cleveland Wire Cloth & Mfg. Co.104
Coast Metals, Inc..... 69
Commercial Shearing and Stamping Co. 83
Concrete Pipe Machy. Co..... 77
Consereo, Inc. 87
Cooper-Bessemer Corp. 3

Dempster Bros., Inc..... 92
*Denver Equipment Co..... 92
De Soto Foundry, Inc..... 89
De Witt Hotels 93
*Diamond Iron Works, Inc..... 92

*Eagle Iron Works..... 89
*Ensign-Bickford Co., The..... 13
Equipment Corporation of America 98-101

Flink Co., The..... 91
*Fuller Co. 29

Gates Rubber Co., The..... 17
*General Electric Company..... 9
General Excavator Co., The..... 91
*Gruendler Crusher & Pulverizer Co. 86
Gulf Oil Corp..... 5

Haiss Mfg. Co., Inc., Geo..... 64
Hallowell, Horace J.....102
*Hardinge Co., Inc..... 61
Heat and Power Co., Inc.....94-95
Heller Stone Co..... 98
*Hendrick Mfg. Co..... 92
Hercules Powder Co..... 22
Hercules Steel Products Co..... 65

*Iowa Manufacturing Co..... 26

*Jackson & Church Co..... 88
Jaeger-Lembo Machine Corp., The. 97
*Jaeger Machine Co., The..... 85
*Jeffrey Mfg. Co..... 84

*Kennedy-Van Saun Mfg. & Eng. Corp. 28
Kenney Machy. Co., George C.... 97
Kent Machine Co..... 77
Koehring Company 21

Lane Co., The T. J.....101
*Laughlin Co., Thomas..... 62
*Link-Belt Co. 1-12
*Link-Belt Speeder Corp..... 12
Loeb Eqpt. Supply Co.....103
Lubriplate Division of Fiske Brothers Refining Company.... 24
Ludlow-Saylor Wire Co..... .....Inside Front Cover

Mack Trucks 11
Magnolia Metal Co..... 60
Mayfair Hotel 70
McCartney Machinery Co..... 96
*McLanahan & Stone Corp..... 93
*Multiplex Concrete Machy. Co.. 85

Neff & Fry Company..... 85
New Holland Machine Co..... 64
*Nordberg Mfg. Co..... 18

*Owen Bucket Co.....104

Patterson Equipment Co.....101
Pennsylvania Drilling Co.....102
Pettibone Mulliken Corp..... 72
Philadelphian Hotel 93
*Pioneer Engineering Works, Inc. 93
*Porter Co., H. K..... .....Outside Back Cover
*Pressed Steel Car Co., Inc. (Koppel Division) 67

Railway Accessories Co..... 98
*Raymond Pulverizer Div. of Combustion Engineering Co., Inc. 31
Rollway Bearing Company, Inc.. 23

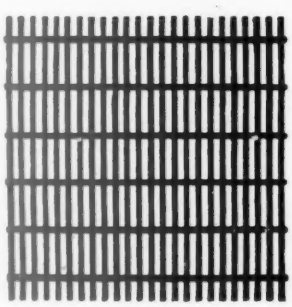
*Sauerman Bros., Inc..... 77
Schaffer Poidometer Co..... 66
Schoonmaker Co., A. G..... 97
Service Supply Corp..... 99
Shiely Company, Inc., J. L...96-103
Simplicity Engineering Co..... 90
*Smidth & Co., F. L..... 27
Smith Engineering Works..... 2
Southern Iron & Equipment Co. 101
Sprout, Waldron & Co., Inc.... 92
Standard Oil Co. of California.. 19
Stanhope, Inc., R. C.....103
*Stearns Mfg. Co..... 73

Taylor Forge & Pipe Works..... 20
Teuscher Pulley & Belting Co... 96
Thomasville Stone & Lime Co....103
*Traylor Engineering & Mfg. Co.. 7
*Tyler Co., The W. S..... 68

United States Rubber Company.. 15
*United States Steel Supply Co.. 90
*U. S. Treasury Department..... 86
Unverzagt & Sons, G. A.....101

Walsh Co., Richard P..... 99
Webber Equipment Co..... 96
*Wellman Engineering Co..... 90
*Westinghouse Electric & Mfg. Co. 14
Whayne Supply Co., Roy C..... 97
*Wickwire Spencer Steel Co..... 25
*Williams Pat. Crusher & Pulverizer Company 93

***See also Detail Information in the 1943 Pit and Quarry HANDBOOK**



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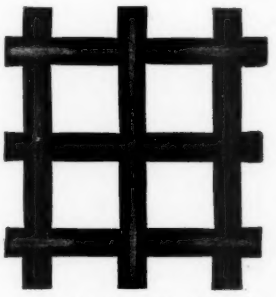

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